DOCUMENT RESUME

ED 362 814 CG 025 075

AUTHOR Ellickson, Phyllis L.; And Others
TITLE Forgotten Ages, Forgotten Problems: Adolescents' Health.
INSTITUTION Rand Corp., Santa Monica, Calif.
REPORT NO ISBN-0-8330-1409-9; RAND-MR-141-RC
PUB DATE 93
NOTE 71p.
AVAILABLE FROM RAND Distribution Services, 1700 Main St., P.O. Box 2138, Santa Monica, CA 90407-2138.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Adolescents; *Child Health; *Health Needs; *Mental Health; *Physical Health; Psychological Characteristics; Well Being; *Youth Problems

ABSTRACT

This monograph presents an overview of adolescent health in the United States. Section 1 provides a brief introduction to the monograph. Section 2 presents one view of what constitutes adolescence and the threat to adolescent health, conceptualizing the latter to include health-compromising behaviors that put adolescents at risk for future problems as adults. Section 3 provides information on the major causes of adolescent mortality and morbidity, arguing that an increasing proportion of adolescent health needs is related to psychosocial and behavioral problems, rather than physical disease. Section 4 examines adolescent access to health care, concluding that adolescents face barriers to obtaining appropriate care that go beyond limitations in insurance coverage. Section 5 provides an assessment of programs aimed at preventing or curing mental disorders and high-risk behaviors. Section 6 describes research initiatives aimed at improving the ability to effect such preventions and cures. Section 6 also suggests mechanisms for the implementation and evaluation of effective health care services for adolescents. The initiatives suggested range from long-term research on both the common and unique antecedents of high-risk behavior among adolescents to the evaluation of prevention and intervention programs specifically designed for different age groups and different levels of risk for future harm. (Contains approximately 225 references.) (Author/NB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

CG

ED 362 814

RAND

Forgotten Ages, Forgotten Problems

Adolescents' Health

Phyllis L. Ellickson, Maria Elena Lara, Cathy Donald Sherbourne, Bonnie Zima

BEST COPY AVAILABLE

CG025075

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Rand Corp.

2 TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

The research described in this report was supported by RAND using its own research funds.

Library of Congress Cataloging in Publication Data

Forgotten ages, forgotten problems : adolescents' health / Phyllis L. Ellickson ... [et al.].
p. cm.
"MR-141-RC."
"Supported by RAND."
Includes bibliographical references.
ISBN 0-8330-1409-9
1. Teenagers—Health and hygiene—United States. I. Ellickson, Phyllis L., 1942- II. RAND.
[DNLM: 1. Adolescence. 2. Mortality—United States. 3. Adolescent Behavior. 4. Risk-Taking—in adolescence. 5. Mental Disorders—in adolescence. 6. Adolescent Health Services—United States. WS 460 F721 1993]
RA564.5.F67 1993
362.1'0835—dc20
DNLM/DLC
for Library of Congress 93-8687
CIP

RAND is a nonprofit institution that seeks to improve public policy through research and analysis. Publications of RAND do not necessarily reflect the opinions or policies of the sponsors of RAND research.

Published 1993 by RAND
1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
To obtain information about RAND studies or to order documents,
call Distribution Services, (310) 393-0411, extension 6686

RAND

Forgotten Ages, Forgotten Problems

Adolescents' Health

Phyllis L. Ellickson, Maria Elena Lara, Cathy Donald Sherbourne, Bonnie Zima

Preface

This monograph presents an overview of adolescent health in the United States—the major causes of adolescent morbidity and mortality, barriers to obtaining appropriate or adequate care, and the strengths and weaknesses of prevention and treatment programs aimed at the "new morbidity" (emotional and behavioral problems and their consequences). It argues that adolescents and their problems have received short shrift in the American health care system, making the case that an increasing proportion of adolescent health needs is related to psychosocial and behavioral problems rather than physical disease. It concludes by suggesting several research and policy initiatives aimed at developing the information and resources needed to improve adolescent prospects for well-being. The initiatives range from long-term research on both the common and unique antecedents of high-risk behavior among adolescents to the evaluation of prevention and intervention programs specifically designed for different age groups and different levels of risk for future harm.

The project was supported by RAND, using its own funds. This report should be of particular interest to policymakers concerned with promoting adolescent health and well-being, to public health and medical professionals, and to those individuals and institutions acting as advocates for children at local, state, or federal levels of government. It should also be valuable to researchers interested in identifying and understanding adolescent problem behavior and ways to ameliorate such behavior.

Contents

Preface iii

Figures and Table vii

Summary ix

Acknowledgments xv

1. INTRODUCTION 1

2. WHO IS AN ADOLESCENT AND WHAT IS ADOLESCENT HEALTH? 2

3. MAJOR CAUSES OF ADOLESCENT MORTALITY AND MORBIDITY 4
   - Unintentional Injuries 5
   - Homicide 6
   - Suicide 7
   - Drug Use 8
   - Sexual Activity 10
     - Teenage Pregnancy 12
     - AIDS and Other Sexually Transmitted Diseases 13
   - Mental Health Problems 15

4. ADOLESCENT HEALTH CARE INSURANCE AND ACCESS TO SERVICES 20
   - Health Care Insurance and Benefits Coverage 20
     - Financial Barriers to Access 20
     - Other Barriers to Access 22
   - Alternative Health Care Delivery Systems 23

5. TREATMENT FOR AND PREVENTION OF HIGH-RISK BEHAVIORS AND MENTAL DISORDERS 26

6. FUTURE RESEARCH NEEDS 30
   - Clarifying the Causes and Course of Risky Behavior and Mental Health Problems 32
   - Testing Strategies for Prevention and Treatment 35
     - Reducing the Risk of AIDS and Teenage Pregnancy 35
     - Testing Early Interventions 36
     - Evaluating Treatment Programs for Adolescents 37
   - Conclusions 38

References 41

Figures

1. Adolescent Deaths per 100,000, in 1990 4
2. Drug Use Among High School Seniors, by Race and Ethnicity, 1991 9
3. Sexual Activity Among High School Students in Grades 9–12, 1990 and 1991 11

Table

1. Child and Adolescent Mental Health Problems 18

Summary

American health needs—what they are and how they can be met—have come to the forefront of the national agenda. Medical expenditures have soared over the past decade; nevertheless, increasing numbers of Americans lack adequate insurance to cover the costs of health care. Adolescents, more and more of whom fall within the categories of the uninsured or underinsured, face additional barriers to obtaining appropriate care, barriers that stem from the kind of health problems adolescents are most likely to face and the difficulty of finding effective ways of preventing or treating those problems.

This monograph examines what is known about the major causes of adolescent morbidity and mortality with a view to assessing the adequacy of current efforts aimed at improving adolescent health and identifying further initiatives to improve our results. It begins with two assumptions: (1) that adolescent health encompasses far more than the absence of physical disease or disability, and (2) that it includes mental and social, as well as physical, well-being. This view of adolescent health implicitly calls for including both behavioral problems and mental disorders among the health community's concerns, a shift in focus that is increasingly endorsed by international and national organizations concerned with health issues. Recent data, which show that the principal causes of adolescent mortality are the result of adolescent behavior, support this shift as well.

Major Causes of Adolescent Mortality and Morbidity

Adolescents start out in good health relative to the rest of the population: Expected deaths for 10- and 11-year-olds are lower than those for any other age. As adolescents grow older, however, their risk of dying increases; the mortality rate for 15- to 19-year-olds is three times that for 10- to 14-year-olds. These differences reflect the fact that proportionately more older adolescents engage in high-risk behavior and are the victims of violence.

Seventy-five percent of all adolescent deaths are attributable to three causes: unintentional injuries (particularly injuries from motor vehicle accidents), homicide, and suicide. Each is more likely to occur among older adolescents; each is also a behavioral phenomenon that is linked with various risk-taking activities and/or negative emotional states (e.g., drug use, drinking and driving,

use of weapons, depression, conduct disorders). Other threats to the health of America's youth include various manifestations of the "new morbidity": drug use (including use of the licit drugs alcohol and cigarettes), violent behavior, unsafe sexual activity, and mental disorders. Such problems often go together: Drug use raises the risk of unsafe sexual behavior; teens with mental health problems often use drugs, and teens who use drugs often have mental health problems. Such problems also afflict substantial proportions of young people. Nearly one-fifth of the nation's high school seniors smoke every day, and about 30 percent are binge drinkers—practices that put them at great risk for developing a long-term addiction to tobacco or engaging in high-risk driving and sexual practices. Over half of the nation's high schoolers are sexually active, but few use condoms or other protective devices consistently. As a result, about one million teenage girls become pregnant each year and the risk of contracting acquired immunodeficiency syndrome (AIDS) or other sexually transmitted diseases (STDs) has increased substantially. In addition, about one in five adolescents suffers from a diagnosable mental disorder, which can develop into life-threatening problems or severely impede the young person's ability to negotiate the developmental tasks of adolescence.

Adolescent Health Care Insurance and Access to Services

The new morbidity affects young people from all ethnic and demographic groups. However, its consequences can be particularly severe for teenagers who lack the resources to get help. Poor and near-poor adolescents, about one-third of whom lack coverage for health care, suffer disproportionately from monetary barriers to access. Nevertheless, a substantial proportion of middle-income teenagers also lack insurance—almost 30 percent of uninsured adolescents live in families with incomes at 200 percent of the poverty level or above.

Access to care is further restricted by limitations on coverage (particularly for many preventive and mental health services), by payment policies that promote expensive hospitalization over less costly community- or family-based treatment services, by adolescent concerns about confidentiality, and by physician failure to identify emotional or behavioral problems, plus adolescent and parental failure to seek help for them.

Given these barriers to care, many people advocate alternative health care systems for adolescents. Comprehensive health care centers that provide multiple services at a single site ("one-stop shopping") have been the most thoroughly studied. While they appear to be an effective strategy for reaching

poor teenagers and for getting them needed services, little is known about their effect on improving adolescent health outcomes.

Treatment and Prevention for High-Risk Behaviors and Mental Disorders

Little also is known about the effectiveness of treatment for substance abuse or mental disorders. Evaluations of drug treatment programs have largely ignored adolescents; they have also focused on such substances as heroin, which few adolescents use. Studies of mental health services for adolescents have been plagued by methodological flaws that make it difficult to identify program-induced gains. Thus, we still lack solid evidence about what treatment regimes work, how long the effects last, and which problems and which adolescents are helped.

Prevention programs have shown modest success in curbing drug use, but the effects tend to erode after one or two years. They are more effective at delaying or reducing cigarette and marijuana use than drinking; they also work better for nonusers and experimenters than for more committed users. Prevention programs aimed at reducing sexual activity and teenage pregnancy appear to have had limited influence, but those that provide condoms and foster their use may be more successful at curbing both the spread of STDs and pregnancy rates.

The relatively modest results of treatment and prevention efforts aimed at high-risk behaviors and mental disorders stem, in part, from their complex causality. Numerous factors have been identified as contributors to drug use: suicide, risky driving, poor mental health, violence, and early or high-risk sexual activity. They include such diverse influences as early onset of deviant behavior, association with deviant peers, societal norms and parental attitudes that promote or tolerate high-risk behavior, beliefs that risky actions will not bring harm, family problems, difficulties at school, and genetic vulnerability. Risk or protective factors that are bound up with familial dynamics, community and social norms, or school experiences are difficult to modify; they are typically beyond the province of the health care providers who see adolescents when they happen to show up in their office or clinic.

Viewing the new morbidity as a public health problem opens the door to coordinated prevention and treatment efforts that may involve families, schools, community agencies, and the media, as well as health professionals. Such coordination is essential if we are to address the multiple forces that foster emotional and behavioral problems. Rather than fostering hospitalization as the

dominant strategy for treating teenagers with mental health or substance abuse problems, we need to promote community-based or school-linked systems of care that recognize the interrelatedness of many adolescent problems. Such systems should provide integrated services for both family and child; they also need to overcome the fragmentation caused by multiple and overlapping delivery.

For prevention programs aimed at entire cohorts of adolescents, as well as early intervention efforts for younger children, including schools in a coordinated program is particularly important. Schools are where most children can be found and where problems can be identified before they become critical. Moreover, some school environments exacerbate emerging problems, while others provide countervailing social climates or rewards for productive behavior. Hence, efforts to modify school practices and norms may help curb high-risk behavior.

Better training in adolescent medicine, including how to communicate with teenagers, may improve the health professional's ability to identify and cope with mental disorders, sexually at-risk teens, and drug abuse. Being able to see the doctor in a setting that fosters communication between health care provider and patient (teen clinics, school-linked health clinics, community-based centers) clearly helps teens talk more freely about personal matters, respond more positively to the doctor, and feel more satisfied with the quality of care received (Ershoff et al., 1992).

If they lack the insurance coverage to get through the door, however, few teens will benefit from greater professionalism and more coordinated services. Current efforts to reform the health care system should aim at both reducing the number of uninsured and underinsured adolescents and providing a basic floor of preventive and mental health services for behavioral, emotional, and physical problems.

Research Needed for Understanding How to Improve Adolescent Well-Being

Making substantial inroads on the new morbidity also requires a deeper understanding of how its component problems arise and the kind of programs that help prevent or cure them. Research efforts that we believe will further these goals—and should receive high priority—include longitudinal studies aimed at clarifying the causes and course of high-risk behavior and mental

disorders, as well as interventions designed specifically for young children and adolescents.

We need a better understanding of how early childhood factors interact and compare with adolescent attributes and experiences in predicting later adolescent problems, as well as which antecedents contribute to only one problem or to several problems. We also need better information about which factors contribute to the *escalation* of high-risk behavior, not just its onset. Because AIDS and pregnancy increasingly threaten younger teenagers, we particularly need longitudinal data on the patterns and antecedents of sexual activity for adolescents under the age of 15.

Although basic research will yield a stronger theoretical and empirical foundation for developing more effective interventions, we should not forgo testing plausible approaches now. Among the more important approaches are (1) AIDS and pregnancy risk-reduction programs for all adolescents; (2) early interventions aimed at strengthening the child's bonds with family and school; and (3) clinical trials of treatments for substance abuse and mental health problems.

Because information alone rarely produces changes in behavior, AIDS prevention programs need to do more than explain how AIDS is acquired and exhort young people not to engage in high-risk behavior. They also need to help young people overcome barriers to practicing safe sex, such as embarrassment about buying and using contraceptives and inability to ask one's partner to use a condom. Specific interventions should be designed for sexually active teens who are difficult to reach (e.g., dropouts, runaways, the homeless), as well as for the in-school population.

Treatment programs for substance abuse and mental disorders need to be designed specifically for adolescents and to take into account their developmental capabilities and limitations. Evaluations of such programs should assess both short- and long-term effectiveness, compare the efficacy of different therapeutic regimes, and assess which regimes work better for which kids and which problems.

We also need to develop and assess early interventions aimed at providing children with a solid foundation for healthy growth and development *before* they reach puberty. Several plausible models for improving familial and school environments already exist; what we lack is sufficient evidence about their long-term effectiveness and how they can be improved.

The most credible and useful information about each of these strategies for promoting adolescent health will come from studies that employ random assignment to treatment and control groups. Although experimental designs are costly and difficult to implement, they provide strong evidence about whether the programs themselves have brought about change. Lacking such evidence, we run the risk of promoting ineffective, or even harmful, interventions.

Acknowledgments

We are grateful to Dr. Barbara Korsch of Children's Hospital and the University of Southern California Medical School for her insightful and constructive review of this monograph. Her suggestions greatly improved the manuscript. We also thank Robert Brook and Arleen Leibowitz for their support and encouragement and RAND for providing the funds to carry out the work.

1. Introduction

Care for adolescents is a forgotten stepchild of the American health care system. Increasing numbers of children between the ages of 10 and 18 lack adequate health insurance and face additional legal, psychosocial, and informational barriers to obtaining needed health services. In addition, the traditional view that "health" is defined by the absence of physical disease lingers in the minds of many, hampering efforts to focus on the "new morbidity"—the increasingly prevalent problems caused by high-risk behavior and poor mental health. Although government and private publications have drawn increasing attention to the new morbidity among our nation's teenagers, we still lack sufficient information about how to prevent or cure many of the problems that threaten their physical and emotional well-being.

This monograph focuses on the major health and psychosocial problems faced by adolescents. It makes the case that adolescents and their problems have received short shrift in the American health care system and suggests critical areas for developing the information and resources needed to improve their prospects. Section 2 presents our view of what constitutes adolescence and the threat to adolescent health, conceptualizing the latter to include health-compromising behaviors that put adolescents at risk for future problems as adults. Section 3 provides information on the major causes of adolescent mortality and morbidity, arguing that an increasing proportion of adolescent health needs is related to psychosocial and behavioral problems, rather than physical disease. Complex in origin and "caused" by multiple factors, such problems are difficult to prevent and treat. Section 4 examines adolescent access to health care, concluding that adolescents face barriers to obtaining appropriate care that go beyond limitations in insurance coverage. It also discusses the pros and cons of innovative health care approaches that seek to overcome service delivery fragmentation by offering "one-stop shopping." Section 5 provides an assessment of programs aimed at preventing or curing mental disorders and high-risk behaviors, and Section 6 describes research initiatives aimed at improving our ability to effect such preventions and cures. Section 6 also suggests mechanisms for the implementation and evaluation of effective health care services for adolescents.

2. Who Is an Adolescent and What Is Adolescent Health?

Often viewed as the transition period between childhood and adulthood, adolescence encompasses important developmental changes and tasks that vary by gender, cultural tradition, and socioeconomic circumstances. Such changes include the onset of puberty, with its accompanying physical growth and sexual maturation, increased social interaction with same- and opposite-sex peers, establishment of independence and autonomy, and preparation for adult roles such as worker, spouse, and caretaker of children and elders. During adolescence, many young people also initiate activities that society may label as reserved for adults (smoking, drinking, sexual intercourse, use of illicit drugs, etc.).

Early adolescence typically covers ages 10 to 14. During this period, the child undergoes many of the physical and social changes associated with puberty and may begin paying more attention to the opposite sex. Girls usually begin the pubertal process before boys. *Middle adolescence*—between ages 15 and 18 or 19—marks a period of rising independence and more intensive interaction with the opposite sex. For many American teenagers, graduation from high school serves as the rite of passage into adulthood and the end of adolescence. However, the term *late adolescence* is frequently used for young people in their early twenties who have delayed entry into adult roles for educational or other reasons (Elliott and Feldman, 1990). Young people in their early twenties share many of the middle adolescent's health problems; however, health care coverage, as well as the service providers frequented, often changes for individuals 18 and older. Consequently, this monograph focuses on early and middle adolescence—ages 10 to 18 or 19.

Defining adolescent health is even more difficult than defining adolescence. Our approach follows that of the World Health Organization, which views health as "complete physical, mental, and social well-being" (*Health Promotion*, 1987). Hence, being in good health involves much more than the absence of physical disease and disability, a position that is becoming increasingly accepted in the medical literature (Vanderpool and Richmond, 1990). A healthy adolescent, then, is "able to live up to (her) potential, to function physically, mentally, and socially, and to experience positive emotional states" (Millstein and Litt, 1990).

Under this definition, promoting adolescent health includes efforts to prevent or treat high-risk behaviors and mental disorders that threaten the adolescent's well-being (including physical health). Health-compromising behaviors that fit within this rubric include drug use, precocious sexual activity, unsafe sex, violence, and inadequate or harmful eating habits.[1] Symptoms of serious mental illness, as well as psychiatric disorders that meet the *Diagnostic and Statistical Manual* (DSM) III-R (1987) criteria, also rank as health problems that should be legitimate concerns of the medical and public health communities. Frequently encompassed under the label "the new morbidity," these high-risk behaviors and psychological problems may have harmful effects on *more* adolescents (both now and in the future) than the physical diseases that are commonly identified and treated by primary health care providers. Finally, promoting adolescent health also includes fostering health-enhancing behaviors, such as practicing good nutrition and wearing bicycle or motorcycle helmets.

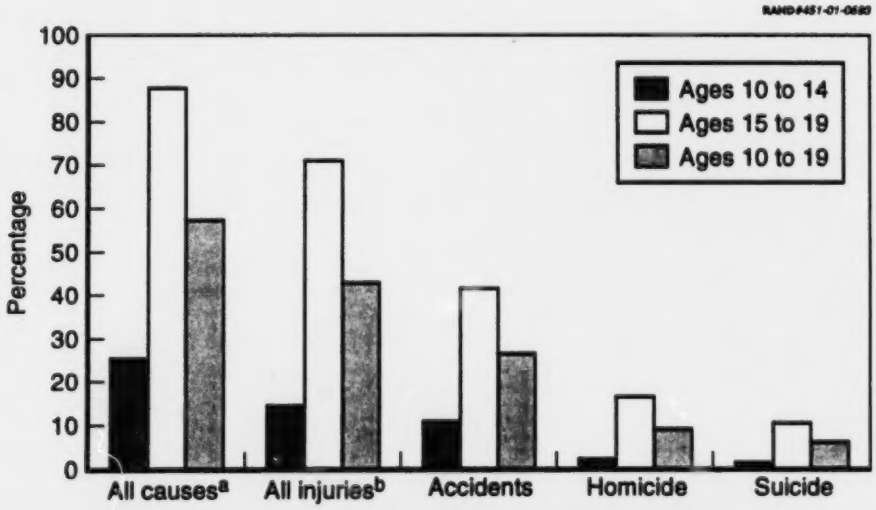
This view of adolescent health implicitly calls for including behavioral problems among the health community's concerns, a shift in focus that is increasingly justified by data showing that the principal causes of adolescent mortality are the result of adolescent behavior. This shift brings to the fore problems that have a complex etiology and are thus difficult to treat. The following section backs up this behavioral assertion with data on the major causes of adolescent mortality and morbidity and their attendant risk factors.

---

[1]Some researchers have also included dropping out of school and delinquency under health-compromising behaviors (Office of Technology Assessment [OTA], 1991a). We have confined this discussion to problems that physicians are more likely to be called upon to diagnose; however, we recognize that dropping out and delinquency may accompany, predict, or follow upon other high-risk behaviors, such as drug use and unprotected sexual intercourse.

3. Major Causes of Adolescent Mortality and Morbidity

While adolescents might appear to be one of the healthiest groups in our population by the physical-disease criterion, they are, in fact, subject to serious health threats from other causes. In 1990, the mortality rate for all adolescents aged 10 to 19 was 58 per 100,000 (see Figure 1). As deaths attributable to infectious diseases have declined, those attributable to accidental and other injuries have attained greater prominence. Indeed, the three major causes of death among adolescents are unintentional injuries (particularly injuries from motor vehicle accidents), homicide, and suicide. Together, they account for about 75 percent of adolescent deaths. None is typically caused by physical disease; rather, each is a behavioral phenomenon that is often linked with



SOURCE: National Center for Health Statistics; computed from unpublished data.

[a]Includes injuries and diseases. Among adolescents, death from disease is relatively rare. Malignant neoplasmas, the next highest cause of death after injuries, occur at a rate of 3.7 per 100,000.

[b]Includes accidents, suicide, homicide, and other injuries.

Figure 1—Adolescent (Ages 10 to 19) Deaths per 100,000, in 1990

various risk-taking activities and/or negative emotional states (e.g., drug use, drinking and driving, use of weapons, depression, conduct disorders).

Adolescents start out in very good health relative to the rest of the population: Expected deaths for 10- and 11-year-olds are lower than those for any other age (U.S. Bureau of the Census, 1991). As they grow older, however, their risk of dying increases. Among 10- to 14-year-olds, the mortality rate in 1990 was about 26 per 100,000; for 15- to 19-year-olds, it was over three times as high (88 per 100,000). These differences reflect the fact that proportionately more older adolescents engage in high-risk behavior and are the victims of violence.

Below we discuss, for each cause of mortality and morbidity, the rate of incidence, the populations most affected, particularly with regard to ethnicity and gender, and the risk factors. The causes discussed are unintentional injuries, homicide, suicide, drug use, sexual activity, and mental health problems.

Unintentional Injuries

Accidental injuries exemplify the relationship between high-risk behavior and adolescent mortality. This category accounts for almost half of all adolescent deaths and nearly two-thirds of injury deaths. A small proportion of accidental deaths is attributable to drowning, accidental firearm injuries, fire, falls, or other accidents. The great majority (about 75 percent) involve vehicles, mostly motor vehicles, particularly in the 15- to 19-year-old group. Such older teenagers account for only about 6 percent of all licensed drivers, but they are responsible for 13 percent of all fatal motor vehicle accidents (U.S. Department of Transportation, 1989). Most adolescents killed as passengers were in vehicles driven by another teenager (Williams and Karpf, 1983).

Both risky driving habits and lack of driving experience contribute to the disproportionate rate of automobile crashes among teenage drivers. Alcohol is a prime culprit, being implicated in about half of these adolescent fatalities. Drinking and driving is particularly dangerous for teenagers, who typically need less alcohol to become intoxicated than adults and who also have less experience in gauging how alcohol affects them. About 25 percent of teenage drivers who are fatally injured were drunk when the accident occurred, although their blood alcohol levels are usually lower than those of fatally injured adult drivers (Lewis, 1988; U.S. Department of Transportation, 1989a, b). Drinking also plays a role in many fatal drownings, as well as in pedestrian and bicycle accidents (U.S. Department of Transportation, 1989a).

Nighttime driving also puts adolescent drivers at risk. More than half of all fatal crashes involving adolescents occur at night, despite the fact that only about 20 percent of adolescent driving occurs during the evening hours (U.S. Department of Transportation, 1989a). Males are involved in nighttime crashes more often than females, possibly reflecting their greater propensity to drink and drive, as well as a tendency to overestimate their driving skills.

Homicide

Homicide is the second leading cause of death among adolescents, accounting for approximately 3,400 deaths among 10- to 19-year-olds in 1990, or about 10 per 100,000 (see Figure 1). Black males face substantially greater odds of death by homicide than any other ethnic or gender group. Although white male adolescents outnumber their black counterparts by almost 5.5 to 1, the number of male homicides for blacks nearly equaled that for whites in 1985 (OTA, 1991c). By 1990, homicide had become the leading cause of death for young black males between the ages of 15 and 24 (Centers for Disease Control [CDC], 1990).

Older teens are considerably more likely to be homicide victims than are younger ones: Nearly 20 percent of deaths among 15- to 19-year-olds are attributable to homicide versus 8 percent for the younger group (National Center for Health Statistics [NCHS], unpublished data). Between 1979 and 1990, the homicide rate for 15- to 19-year-olds rose substantially—from 6.9 to 17.0 per 100,000 population—a dramatic rise attributable to firearm homicides (Fingerhut, Ingram, and Feldman, 1992). Murders with guns are most likely to occur in urban areas, particularly core metropolitan neighborhoods, and they pose increasingly ominous threats to both white and black young people and to both males and females. Whereas the overall rate is much higher for black urban males than for other groups, annual increases in firearm homicide rates between 1987 and 1989 averaged about 30 percent per year for black males, white males, and black females in the metropolitan core (Fingerhut, Ingram, and Feldman, 1992). Many of these deaths are caused by other adolescents or young adults, who are increasingly inclined to carry weapons. Over 25 percent of ninth- to twelfth-graders report having carried a weapon such as a gun, knife, or club at least once in the last 30 days; for young males, that proportion jumps to 41 percent (*Journal of School Health*, 1992).

These statistics, among others, have given rise to a new sense of alarm about violence in America. Calling violence a public health emergency, a recent editorial in the *Journal of the American Medical Association (JAMA)* urged the passage of legislation to restrict ownership and use of firearms and greater

support for research on the causes, prevention, and cure of violence (Koop and Lundberg, 1992). Existing data suggest that living in the crowded urban core, poverty, belonging to a gang, having a prior history of antisocial behavior, and access to firearms all constitute individual risk factors for engaging in homicide or being a homicide victim. Violence on a large scale, such as that sparked by the Rodney King verdict in Los Angeles, reflects both immediate outrage at the triggering event and more deep-rooted social problems. Developing a sufficient understanding of this complex phenomenon to effectively prevent or curb its occurrence, either on an individual or a mass scale, will require an intensive research effort.

Suicide

Suicide is the third leading cause of death among adolescents, accounting for 12.6 percent of all deaths among 15- to 19-year-olds, but only 6 percent of deaths in the younger group (NCHS, unpublished data). Among older adolescents, suicide rates have increased markedly over the past four decades, quadrupling since 1950 (OTA, 1991c). In 1990, the reported rate for 15- to 19-year-olds was 11.1 per 100,000 (see Figure 1). Given the stigma associated with suicides, the actual rate is probably higher.

Suicide also varies by ethnicity and gender. White teenagers are more likely to commit suicide than black teenagers, and white males aged 15 to 19 have higher completed suicide rates than either white females or blacks. However, the highest suicide rates occur among Native American adolescents (OTA, 1991c).

Common risk factors for suicide include previous suicide attempts, substance abuse, depression, social isolation, parental absence, problems in school, and history of parental abusiveness (Shafii et al., 1985; Adams and Overholser, 1992; Alcohol, Drug Abuse, and Mental Health Administration [ADAMHA], 1989). However, since different studies examine different risk factors, it is difficult to rank-order them from most to least important. While over 50 percent of teenagers who have committed or attempted suicide have made a previous suicide attempt or threat (Gispert et al., 1985), even more suffer from some form of psychiatric illness and/or substance abuse problem.

Adolescents who exhibit *both* antisocial behavior and depression are particularly at risk. One study of attempted suicides found that 95 percent had a diagnosed mental disorder, with substantial numbers classified as having an affective disorder (76 percent), exhibiting antisocial behavior (70 percent), or having an alcohol or drug problem (70 percent) (Shafii et al., 1985). Another study

highlighted familial and school correlates of attempted suicide, finding that four-fifths came from disrupted families (did not live with both natural parents), and half of them were a grade behind their peers. Nearly 50 percent no longer went to school or were truant (Gispert et al., 1985).

Drug Use

Drug use constitutes a serious threat to the health of substantial numbers of American youth. Among adolescents, as well as adults, cigarettes and alcohol are the drugs of choice. Together, these two "legal drugs" cause more adult deaths than all the illicit drugs combined. Approximately 400,000 Americans die each year from illnesses linked with tobacco products—heart disease, lung cancer, emphysema, etc. (Office on Smoking and Health, 1990). Another 200,000 die as a result of alcohol-related accidents and disease.

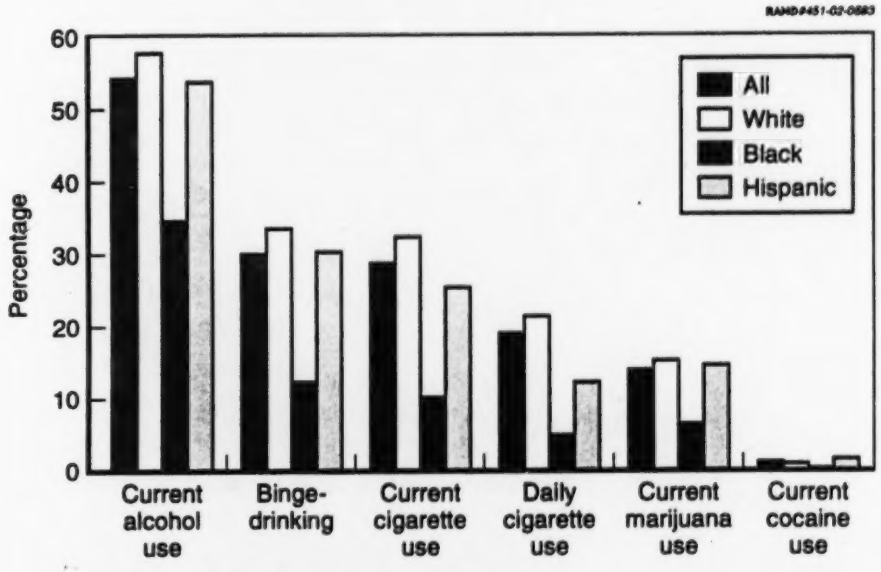
A substantial number of children begin smoking at an early age, becoming addicted to nicotine years before experiencing significant physical illnesses attributable to cigarette use. In one study of seventh-graders from 30 junior high schools in California and Oregon, about 50 percent had already tried cigarettes (Ellickson and Bell, 1990a). Forty percent of that group had smoked three or more times, putting them at serious risk for developing a long-term addiction.[1] By the time they are seniors, about 28 percent of the nation's youth are current smokers, and 19 percent smoke every day (see Figure 2).[2] Thus, cigarette use threatens the future health of at least one-fifth of America's teenagers.

Drinking, either casual or heavy, poses health threats that are more immediate than those posed by tobacco use—for example, suffering injury or death from drinking-related accidents and being more likely to engage in other unsafe activities (unprotected sexual intercourse, engaging in violent behavior, etc.). Nevertheless, drinking is even more prevalent than smoking among young people, more than half of whom qualify as current drinkers by grade 12 (see Figure 2). Many also engage in binge-drinking, which significantly heightens the likelihood of other high-risk behavior. An alarming 30 percent of high school seniors have participated in recent bouts of binge-drinking (having five or more drinks in "one sitting"), and more than 40 percent of that number have done so as eighth-graders (National Institute on Drug Abuse [NIDA], 1992a).

---

[1] A British study has estimated that the majority of those who try cigarettes four or more times have smoking careers lasting several decades (Russell, 1990).

[2] Because they omit high school dropouts, whose smoking rates exceed those of the stayers, these numbers underestimate the total. This qualification also applies to the statistics on adolescent use of other drugs.



SOURCE: National Institute on Drug Abuse, 1992b.

NOTE: Current use = any use in past month; binge-drinking = 5+ drinks in one sitting in the past two weeks.

Figure 2—Drug Use Among High School Seniors, by Race and Ethnicity, 1991

Despite recent declines in rates of illicit drug use, large numbers of teenagers continue to be current users. In 1991, about 16 percent of high school seniors had used one or more illicit drugs in the past month (NIDA, 1992b). Much of the drop in illicit drug use—which is less than half the peak use of 1979—is accounted for by the decline in current marijuana use (from 36 percent in 1979 to 14 percent in 1991). In addition, because young people are unlikely to try other illegal drugs if they have not already tried marijuana (Kandel, 1975; Ellickson and Hays, 1992), downward shifts in marijuana use may also spur declines in use of the other illicit drugs. Today, for example, slightly over 1 percent of twelfth-graders are current cocaine users, whereas that figure was nearly 7 percent in 1985 (NIDA, 1992b). Use of stimulants has also declined, from 11 percent in 1982 to 3 percent in 1990 (NIDA, 1992b), whereas intravenous (IV) drug use among ninth- to twelfth-graders has stabilized at less than 2 percent since 1989 (CDC, 1992c). Contrary to popular stereotypes, prevalence rates among white and Hispanic youth are typically higher than those for black adolescents (and lowest for Asian-Americans). Socioeconomic status (SES) does not distinguish drug users from nonusers, and the gap between male and female drug use is narrowing (although males still outrank females in the proportion who drink and use illicit drugs).

Although illicit drugs are less popular among adolescents than cigarettes and alcohol, their use still merits serious concern. Many illicit drugs impair judgment and loosen inhibitions; hence, adolescents who are on them are more likely to be involved in fatal accidents and to engage in the sexual risk-taking associated with AIDS, other STDs, and pregnancy. Intravenous drug use, particularly needle-sharing, greatly increases the risk of becoming infected with human immunodeficiency virus (HIV).

Drug use can also exacerbate depressed mood and anxiety, thereby contributing to suicide, and can impair the adolescent's ability to take on adult roles. A recent study examined how chronic use of illicit drugs during high school affected young people eight years later. It found that the chronic drug users were more likely to have unstable marriages, to have difficulty keeping a job, and to experience serious emotional distress (Newcomb and Bentler, 1988). Marijuana was the dominant, and often the only, illicit drug these adolescents had used during high school, indicating that the potential effect of early marijuana use on subsequent well-being as a young adult is by no means negligible.

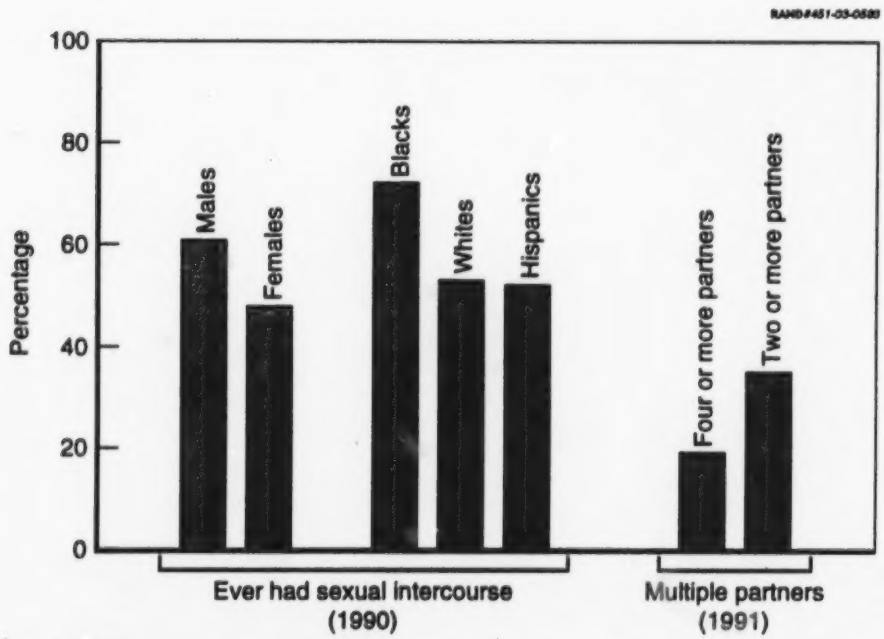
The two most powerful predictors of current drug use are early age of onset and use by one's peers. Beginning to use before age 15 is also associated with later drug abuse (Robins and Pryzbeck, 1985). In addition, the sequential nature of drug use initiation—from alcohol and cigarettes to marijuana to other illicit drugs—has been verified in numerous studies over the years (Kandel, 1975; Ellickson and Hays, 1992). Hence, many prevention programs focus on preventing or delaying initial use of the three most prevalent drugs and keeping experimenters from escalating their use (Ellickson et al., 1988).

Other risk factors associated with drug use initation include parental use (particularly during the early adolescent years), peer and parental tolerance of drugs, beliefs that drugs are hard to resist and have more benefits than costs, engaging in other deviant behaviors, and problems within the family and at school (disrupted family, inadequate parental interest and attachment to the child, poor academic achievement and expectations).[3]

Sexual Activity

Sexual activity is at least as widespread among adolescents as drug use (see Figure 3). In 1991, almost 55 percent of American teenagers in grades 9–12 reported having had sexual intercourse, and 19 percent had had four or more

[3]For a comprehensive review of drug use antecedents, see Chassin (1984) and Ellickson (forthcoming).



SOURCE: Centers for Disease Control, 1992a, c.

Figure 3—Sexual Activity Among High School Students in Grades 9–12, 1990 and 1991

partners (CDC, 1992c). Boys are more likely to have had intercourse than girls (61 percent versus 48 percent), and black teenagers have higher rates of initiation than white and Hispanic teenagers (72 percent versus 52 percent and 53 percent) (CDC, 1992a). Homeless and runaway youth, as well as those with lower SES, exhibit particularly high rates of sexual activity (OTA, 1991c).

In addition, more teens are having sex at younger ages. The National Survey of Family Growth found that the proportion of sexually active girls aged 15 to 19 rose from less than 30 percent in 1970 to over 50 percent in 1988 (U.S. Department of Health and Human Services [DHHS], 1991a).[4] Nevertheless, older adolescents are considerably more likely to be sexually active than younger teens. The CDC's 1990 Youth Risk Behavior Survey showed that 40 percent of ninth-graders reported having had sexual intercourse (25 percent in the prior three months) compared with 72 percent of twelfth-graders (55 percent in the prior three months) (CDC, 1992a).

[4]National data are not available for teens under age 15.

These figures mean that large numbers of teens, particularly those aged 15 or older, are exposed to the health risks associated with sexual activity. The most serious of those risks are unintended pregnancies and sexually transmitted diseases, including HIV infection and AIDS.

Teenage Pregnancy

Approximately one million teenage girls become pregnant each year in the United States (U.S. DHHS, 1991c). Older teens are substantially more likely to become pregnant than younger ones, as are blacks and Hispanics (Henshaw and Van Vort, 1989). Black teenagers have historically had much higher pregnancy and birth rates than white adolescents: In 1988, the birth rate for black 15- to 17-year-olds was nearly three times higher than that for whites. Data for Hispanic teenagers suggest that they are less likely to use contraception and abortion as birth control methods than non-Hispanic whites and thus are somewhat more likely to have babies (U.S. DHHS, 1991b).

About half of the one million pregnant teenagers give birth each year, with ever-increasing proportions of those births being to unmarried adolescents. About 40 percent of pregnancies among 15- to 19-year-olds are intentionally aborted, a figure that has remained fairly level since the late 1970s (Alan Guttmacher Institute, 1989). By 1988, nearly two-thirds of babies born to young mothers in the United States (and more than 90 percent of those born to black teenagers) were born out of wedlock, which means that they likely start life without a father and in a strained economic situation (Moore, 1988; U.S. Congress, 1989). Because teenage mothers are less likely to eat nutritiously or to get prenatal care and are more likely to smoke or drink than older mothers, they are also more likely to give birth to low-birthweight infants.

The teenage pregnancy rate in the United States tops that in all other Western developed countries, despite the fact that those countries have similar rates of sexual activity and ages of initiation (Alan Guttmacher Institute, 1989). Indeed, the U.S. rate is more than twice as high as the rate in Canada, Denmark, England, Wales, Sweden, Norway, New Zealand, Finland, and The Netherlands. These facts suggest that American teenagers are much less likely to use contraception than their European counterparts, a characteristic that also puts them at comparatively greater risk for sexually transmitted diseases.

AIDS and Other Sexually Transmitted Diseases

Sexually active teenagers are at risk for contracting all types of STDs. STDs other than AIDS are among the most "pervasive and costly communicable diseases threatening adolescents today" (OTA, 1991b). Approximately 86 percent of all STDs occur among persons aged 15 to 29 (U.S. DHHS, 1991c). The most common are chlamydia, gonorrhea, and syphilis. Depending on the population surveyed, infection rates for chlamydia range between 3 and 37 percent of adolescents, with black teens from low-income households having the highest rates (OTA, 1991b). National data, available only for gonorrhea and syphilis, indicate that, in 1989, teenagers between the ages of 10 and 19 accounted for 30 percent of new gonorrhea cases and 10 percent of new syphilis cases (OTA,1991c). That percentage amounts to over 215,000 cases of gonorrhea. Although the gonorrhea incidence rate has been relatively stable for 15- to 19-year-olds, it rose by 63 percent for 10- to 14-year-olds between 1987 and 1989. Syphilis rates, which had dropped between 1984 and 1986, reached their highest levels since 1965 in 1987 (U.S. DHHS, 1987) and have increased slightly since then. Overall, approximately one in five adolescents will have acquired a sexually transmitted disease by the time he or she is 21 years old (U.S. DHHS, 1991c).

Many STDs can be cured or controlled. However, if left untreated, they can have serious consequences, e.g., infertility, ectopic pregnancy, gonococcal arthritis. Moreover, teens who suffer from an STD other than AIDS may also be at risk for HIV infection, which still has no known cure. The devastating effects of AIDS, which eventually leads to death, make it a major health threat and one that is becoming more and more ominous for adolescents. Although only 560 cases had been reported for adolescents aged 13 to 19 by September 1990, AIDS is now the sixth leading cause of death for American adolescents and young adults between the ages of 15 and 24 (Kilbourne, Buehler, and Rogers, 1990). About 20 percent of all reported AIDS cases are in the 20-to-29 age group, many of whom, given the long incubation period for AIDS, must have been infected during or just after high school (Hingson et al., 1990). That proportion will likely increase as heterosexual intercourse becomes a more dominant mode of AIDS transmission.[5]

Adolescents with high-risk profiles for AIDS and other STDs include low-income blacks and Hispanics, runaways, and the homeless. Blacks accounted for 36 percent and Hispanics for 18 percent of the AIDS cases reported by 1989 (OTA, 1991c). High-risk sexual behavior (having multiple sex partners, engaging in

---

[5]In 1991, AIDS cases increased by 28 percent among women and by 15 percent among men (Hingson, Strunin, and Berlin, 1992).

unprotected intercourse) sharply increases the chances of contracting all STDs. Nearly 20 percent of high school students have had vaginal intercourse with four or more partners; over one-third have had more than one partner (CDC, 1992a). Whereas 78 percent of adolescents who had had vaginal intercourse in 1990 used some form of contraceptive "the last time," far fewer (45 percent) used condoms (CDC, 1992b). Among sexually active teens, consistent use of condoms is even lower (Hingson, Strunin, and Berlin, 1992).

Male-to-male sexual relations, sharing needles for IV drug use, and having sex with IV drug users are the most common ways of becoming infected with HIV. Early injection of drugs (before age 18) acts as a marker for HIV risk (Battjes, Leukefeld, and Pickens, 1992). Although we lack precise information on homosexual behavior among adolescent males, available data suggest that at least 3 percent of young men aged 15 to 19 have engaged in some form of same-gender sexual activity such as mutual masturbation, or oral or anal sex (Sonenstein, Pleck, and Ku, 1989). In specific locations, such as New York City, that proportion may be three times as high (Reuben et al., 1988). For adolescent females, heterosexual intercourse is a particularly important transmission route, accounting for 45 percent of the reported cases. The role of heterosexual sex in the transmission of AIDS among young people is highlighted by age differences in the male-to-female ratio of reported cases—10:1 for adults over age 25, but only 4:1 for adolescents. Hence, the major strategies for preventing adolescent AIDS involve promoting safe sex or no sex at all and discouraging shared-needle use among IV drug users.

Additional risk factors for both teenage pregnancy and STDs are those associated with being sexually active *and* not following safe-sex guidelines. A key predictor is age of first intercourse, because it is associated with a lower likelihood of effective contraception use and lengthens the "at-risk" period. Having sexual intercourse before age 15 increases the risk of both pregnancy and sexually transmitted diseases (National Academy of Sciences [NAS], 1987).

Factors associated with early initiation and greater sexual activity include early pubertal development, early dating, beliefs that one's peers are sexually active, low religiosity, use of illicit drugs other than marijuana, and low academic achievement and expectations (NAS, 1987; Jones and Philliber, 1983; Zelnick and Kantner, 1977; Elliott and Morse, 1992). Girls whose mothers had early sexual experiences and babies at young ages are likely to follow suit, and fatherless girls and those without firm parental limits also tend to be early initiates (NAS, 1987). For females, factors associated with effective contraceptive use include age, parental support for use of contraception, knowledge of reproduction and contraception, acceptance of one's sexuality, high academic aspirations, and

having a "committed relationship" (Mosher, 1990; Zelnick and Kantner, 1977). Among sexually active teens, consistent use of condoms is promoted by concerns about becoming HIV-infected or getting pregnant, beliefs that preventive measures work, and perceptions that one's partner would use a condom if asked and would not be embarrassed (Hingson, Strunin, and Berlin, 1992).

Mental Health Problems

A significant proportion of the nation's children and adolescents suffer from mental and developmental disorders. The National Institute of Mental Health (NIMH) estimates that between 7.5 and 14 million (12 to 22 percent) of persons under the age of 18 suffer from at least one diagnosable mental disorder, and half of them are deemed severely handicapped (NIMH, 1990). On the basis of a review of several recent studies of nonclinical samples, the Office of Technology Assessment concluded that the overall prevalence of diagnosable mental disorders among adolescents approximates one in five (OTA, 1991b). With the exception of depression and eating problems, diagnosable disorders appear to be more common among male than female adolescents.

Mental health problems appear to increase during adolescence. The 1988 National Health Interview Survey (NHIS), which used a global parental assessment of the child's emotional and behavioral problems, found a lifetime prevalence rate of 18.5 percent for 12- to 17-year-olds compared with 12.7 percent for 6- to 11-year-olds (Zill and Schoenborn, 1990). Among the most common problems reported in studies done since 1980 are disruptive behavior disorders (attention deficit hyperactivity disorder [ADHD], conduct disorder, and oppositional defiant disorder), anxiety disorders, mood disorders, and substance abuse. Eating disorders (anorexia nervosa and bulimia) affect a substantial number of female adolescents.

Depending on the specific problem, individual consequences of early childhood emotional disorders include low self esteem, impaired peer relationships and social skills, academic failure, and greater risk of injury or death from trauma, homicide, or suicide. Failure to meet essential developmental and academic tasks because of untreated emotional and behavioral disturbances potentially handicaps the child physically, emotionally, and socially for the rest of his or her life. Furthermore, a disturbed child's relationship with parents and siblings is often severely strained, increasing the child's risk for physically abusive disciplinary methods and fights with siblings (Tallmadge and Barkley, 1983).

Adolescents with mental disorders are highly likely to be substance abusers, and those who abuse substances are likely to exhibit poor mental health. In an inpatient sample of 57 adolescents with a drug problem, conduct disorder was the most frequent additional diagnosis (42 percent), followed by depression (35 percent) and attention deficit hyperactivity disorder or impulse disorder (21 percent) (DiMilio, 1989). In a large community sample of 812 children identified by the mental health or public school system as having a serious emotional disturbance, children between the ages of 8 and 18 with a marijuana or alcohol disorder were found more likely to have a co-occurring conduct disorder, depression, or ADHD than those children who did not report substance use (Greenbaum et al., 1991). Earlier studies also found elevated rates of substance use among adolescents with conduct disorder (Elliott, Huizinga, and Menard, 1989; Robins, 1978) and among depressed youth (Deykin, Levy, and Wells, 1987; Famularo, Stone, and Poppes, 1985). In the general adolescent population, however, comorbidity rates of serious mental health problems and polydrug use are quite low (Elliott, Huizinga, and Menard, 1989).

Risk factors for emotional and behavioral problems among children include poverty, single-parent family, marital discord, divorce, parental mental illness and/or substance abuse, abuse and neglect, exposure to extreme violence, chronic physical illness, developmental delays, and mental retardation (Keller et al., 1986; Rutter and Quinton, 1984; Rutter, 1975, 1985; Rae-Grant et al., 1989; Steinhausen, Gobel, and Nester, 1984; Lahey et al., 1988; Pynoos et al., 1987; Orr et al., 1984; Heller et al., 1985; Werner and Smith, 1982). Conversely, good physical health, at least one supportive parent, ability to sustain good peer relationships, and social competency may protect a child from developing a serious emotional or behavioral disorder (Garmezy, Masten, and Tellegen, 1984; Rutter, 1985).

Several constraints, both methodological and practical, have hindered our ability to obtain prevalence estimates for specific mental disorders in the *general* population of children and adolescents. First, diagnostic criteria for mental disorders are still evolving; moreover, within an individual, developmental changes may alter the presentation of psychopathologic symptoms. Second, symptomatic children and adolescents often meet diagnostic criteria for more than one disorder. Third, few reliable and well-validated screening instruments are available for identifying mental disorders in the general child population.

Thus, precise estimates of how many adolescents suffer from *specific* mental disorders await information from the Child Epidemiological Catchment Area Study. At present, our information about adolescent mental disorders must be pieced together from studies that use different measures, cover varying age

groups, and include different conditions. Table 1 provides preliminary information about prevalence rates for specific disorders, comorbid conditions, and associated consequences.

Table 1

Child and Adolescent Mental Health Problems

Mental Disorder	Prevalence	Boys:Girls		Associated Problems
Attention deficit hyperactivity disorder	~10%[a]	5:1[b]	**Concurrent:**	School failure, conduct disorder, drug use disorder, phobic anxiety, somatization[c]
			Future:	In conjunction with conduct disorder: car accidents, felony convictions, suicide attempts, antisocial personality[c]
Conduct and oppositional defiant disorders	3–9%[d]	Unknown; boys > girls	**Concurrent:**	Juvenile delinquency, truancy, fire-setting, stealing, school failure, traumatic injuries from fights and accidents, pregnancy, drug addiction, suicide, subject to rape or homicide, attention deficit hyperactivity disorder, bipolar disorder, depression, learning disorders[e]
			Future:	Alcohol abuse, psychiatric hospitalization, antisocial behavior, financial dependence, poor employment[f]
Depression	5%[g]	1:2[h]	**Concurrent:**	Hypersomnia, weight changes, drug and alcohol use, suicide, poor nutrition, poor school performance, impaired peer relationships, conduct disorder, substance abuse, anorexia nervosa, bulimia nervosa, suicide[i]
Anxiety disorders	17%[j]	Varies with type	**Concurrent:**	Suicide[k]

Table 1—continued

Mental Disorder	Prevalence	Boys:Girls	Associated Problems	
Eating disorders	1%[l] (anorexia)	1:9[m]	**Concurrent (anorexia):**	Dehydration, electrolyte imbalance, hypertension, anemia, death[n]
	5–18%[o] (bulimia)		**Concurrent (bulimia):**	Alcohol abuse, stealing, sexual activity, suicide attempts, mood instability, borderline personality disorder, depression[p]

[a]OTA, 1991b
[b]Cantwell, 1975
[c]Mannuzza et al., 1991; Weiss and Hechtman, 1986
[d]DSM III-R, 1987
[e]Milin et al., 1991; Hirschi and Hindelang, 1977; Brickman et al., 1984; DiMilio, 1989
[f]Robins, 1966
[g]Kashani et al., 1987
[h]Puig-Antich and Rabinovich, 1983
[i]Ryan et al., 1987; Hoberman and Garfinkel, 1988; Kovacs et al., 1988; Pfeffer et al., 1991
[j]Kashani and Orvaschel, 1988
[k]Mattison, 1988; Pfeffer et al., 1979, 1980
[l]Jones et al., 1980; Szmulker et al., 1986
[m]Herzog and Copeland, 1985
[n]Jones et al., 1980; Anderson and Mickalide, 1983
[o]Strober, 1980, 1985
[p]Strober, 1980, 1985; Small, 1984; Cooper and Fairburn, 1986

4. Adolescent Health Care Insurance and Access to Services

Health Care Insurance and Benefits Coverage

A recent analysis of NHIS data stated that approximately 4.6 million adolescents lacked any health insurance in 1989 (Newacheck, McManus, and Gephart, 1992). That amounts to slightly over 15 percent (or about one in seven) of America's 31 million adolescents, a proportion that has been increasing over the past 15 years. Between 1979 and 1986, for example, the number of adolescents without any health insurance, public or private, increased by 25 percent (OTA, 1991c). The following subsections describe financial and other barriers to health care access.

Financial Barriers to Access

Poor and near-poor adolescents, about one-third of whom lack coverage for health care, suffer disproportionately from this insurance gap. One explanation for their plight involves the link between Aid to Families with Dependent Children (AFDC) and Medicaid. Whereas AFDC recipients are entitled to Medicaid coverage, the eligibility rules make many adolescents ineligible: AFDC income eligibility limits vary from state to state, ranging from 13 percent of the federal poverty level in Alabama (or $1,488 for a family of three) to 101 percent in California (Newacheck, McManus, and Gephart, 1992). Until October 1990, many states required AFDC families to meet categorical requirements (such as one parent being disabled or absent) that automatically excluded children living with both parents. However, as of October 1990, federal legislation mandates that two-parent families whose principal breadwinner is unemployed are eligible for AFDC.

Although Medicaid benefits for poor children have been extended in recent years, the current generation of adolescents has been largely left out. One recent law (Omnibus Budget Reconciliation Act of 1989, Public Law 101-239) requires states to provide Medicaid benefits to all pregnant women and children up to age 6 with incomes up to 133 percent of the federal poverty level; another (Omnibus Budget Reconciliation Act of 1990, Public Law 101-508) extends coverage to children aged 6 to 19 who live in families with incomes up to 100 percent of the poverty level *and* who were born after September 30, 1983. The first revision

leaves adolescents out; the second excludes the near poor and adolescents who are currently between ages 10 and 19. Thus, when and if both laws are fully implemented across the 50 states, adolescents will still be at a disadvantage relative to younger children.

Both poor and better-off adolescents have also suffered from recent declines in private health insurance coverage. Indeed, between 1984 and 1989, middle-income families experienced the largest growth in uninsurance (Ries, 1991). By 1988, almost 30 percent of uninsured adolescents lived in families with incomes 200 percent of the poverty level or above (OTA, 1991c).

Limits on what conditions are covered by private insurance or Medicaid, particularly the former, further restrict the adolescent's access to care. Whereas Medicaid covers a wide range of services, including acute and preventive care, private insurance policies often leave out many preventive health services (annual examinations, Pap smears, vision and hearing tests, etc.). In addition, private policies frequently do not pay anything until a deductible amount has been paid by the family and often require cost-sharing for care beyond the deductible. Medicaid, in contrast, requires little extra cost-sharing.

However, Medicaid coverage of optional services may vary sharply from state to state. In practice, that variation is particularly severe for mental health benefits. Optional services, which a state is permitted—but not required—to provide, include inpatient psychiatric services for persons under age 21; services of other licensed practitioners (such as psychologists); dental services; physical, occupational, and speech therapy; rehabilitative services; and prescription drugs. States can impose strict limits on the frequency and number of covered services, both mandatory and optional (OTA, 1991c). Thirty-eight states permit coverage of inpatient stays in freestanding psychiatric facilities, but only 10 states allow reimbursement to residential treatment centers. Forty states cover mental health visits in a general hospital outpatient setting, whereas only 21 states cover outpatient services at psychiatric hospitals. While all states cover physician care, one-fourth impose limits on the number of office visits to psychiatrists. Nearly half do not cover nonphysician mental health providers (e.g., psychologists and clinical social workers), even when they are supervised by a psychiatrist. Similar differences exist for substance abuse treatment (OTA, 1991c).

Such variations have led some experts to argue that Medicaid payment policies discourage less costly treatment alternatives for mental health and substance abuse (Taube, Goldman, and Salkever, 1990). Private insurance plans, which often restrict or fail to cover community or family-based mental health services, have clearly fostered inappropriate hospitalization of adolescents (OTA, 1991c;

Knitzer, 1982; Weithorn, 1988): Admissions of children and adolescents to private psychiatric facilities rose by 154 percent between 1980 and 1986 (Lynch, 1992), a trend that contrasts directly with studies showing that adolescents get better and less expensive care outside hospitals than in them (Kiesler, 1982a, b). For this reason, and because inpatient mental health and treatment costs for adolescents often exceed those for adults (Friedman and Kutash, 1992), many employers are considering restricting or excluding coverage for dependents with mental health or chemical dependency illnesses.

Other Barriers to Access

Other barriers to access include concerns about confidentiality, physician failure to identify emotional or behavioral problems, and patient and/or parent failure to seek help for such problems. Many adolescents fear that their physician will not keep information about their sexual behavior or other problems confidential. Those fears are not unfounded. One study found that 61 percent of the general practitioners, surgeons, and internists sampled said they would inform a pregnant 15-year-old's mother about the pregnancy, despite the daughter's request not to do so (Novack et al., 1989). However, most obstetricians and gynecologists (63 percent) would honor the patient's request.[1] The older the physician, the more likely he or she will be to break the adolescent's confidence (Lovett and Wald, 1985; Novack et al., 1989). Moreover, most private health insurance plans require the parent to submit the claim for reimbursement, thereby ensuring parental knowledge of the visit. Teenagers who must show the parent's Medicaid card to obtain access to care have similar problems.

In addition to the above barriers, primary care physicians often feel that they lack the training to deal with teenage psychosocial problems, which many view as not "medical" (Coles, 1990). In one study, only one-third of 91 medical residents felt confident about managing such behavioral phenomena as rape, homosexuality, and delinquency (Figueroa et al., 1991). In a national mail survey of primary care physicians, Blum found that at least 50 percent reported that they had received insufficient training in 10 areas relevant to adolescent health care, 8 of which deal with psychosocial, behavioral, and mental health problems (Blum, 1986, 1987).

These deficiencies show up in actual diagnoses. Two studies that compared pediatricians' reports of emotional and behavioral problems in children and

[1] In addition, physicians who spend more than 20 percent of their time with adolescent patients and those who belong to a formal society devoted to adolescent medicine are much more likely to support patient confidentiality (Lovett and Wald, 1985).

adolescents with independent psychiatric assessments found little relationship between the two. In both studies, pediatricians under-reported psychiatric problems; in the second, they failed to identify 83 percent of children with problems (but did correctly identify 84 percent of the mentally healthy subjects) (Chang, Warner, and Weissman, 1988; Costello, Edelbrock and Costello, 1988). Physicians also underestimate the presence of substance abuse problems, in part because of inadequate training, in part because of patient concealment, and in part because of insufficient time spent with the patient (OTA, 1991c).[2] Nevertheless, relatively few physicians want more training in adolescent medicine (Figueroa et al., 1991; Blum, 1987).

Parents, perhaps sensing these obstacles, are less likely to raise emotional and behavioral issues with the family doctor than with teachers or mental health professionals. In one study of children with behavioral disorders, parents of children seen in clinics were more likely than parents of children not seen in clinics to have previously discussed the child's problems with the school, but they were *not* more likely to have talked with the family doctor (Shepard, Oppenheim, and Mitchell, 1966). In another study of adolescents with a diagnosable disorder, only 6 percent had consulted a pediatrician or general practitioner about the problem, compared with 31 percent who sought advice from a teacher and 33 percent who sought advice from a mental health professional (Cohen et al., 1991). Physicians rarely made referrals to mental health specialists, and many children with problems were not being seen by anyone, a conclusion shared with other studies (Bird et al., 1988; Offord et al., 1987).

Alternative Health Care Delivery Systems

Given these barriers to care for adolescents, a number of alternative health care systems have sprung up across the country. They include comprehensive health care centers that provide multiple services at a single site ("one-stop shopping") and efforts to integrate services through case-management and other techniques. Among the comprehensive centers are hospital-based adolescent health care clinics, community-based adolescent clinics, health maintenance organization (HMO) teen centers, multiservice centers such as The Door in New York City, and school-linked health clinics (SLHCs; the most numerous) on or near school grounds.

---

[2]Note that the average amount of time pediatricians spend with adolescents is about 11 minutes (Hoekelman et al., 1983).

Although SLHCs are among the most thoroughly researched, little is known about the extent to which they improve health outcomes. What we do know is that they appear to provide an effective model for reaching poor adolescents and providing services that adolescents both need and want. Typically located in low-income communities whose residents have limited access to health care, SLHCs serve large numbers of adolescents who either have no other regular source of care or use emergency rooms for medical care. In one study of SLHCs, about 55 percent of the students enrolled in the clinics had no other source of primary health care and 34 percent were uninsured (Kirby, Waszak, and Ziegler, 1989). Another evaluation of 23 school-linked clinics found that more than 80 percent of visits were by return patients, indicating that students felt the help was sufficient to warrant coming again. The three most common reasons for clinic visits were acute illness and accidents (26 percent), mental health problems (21 percent), and physical exams and other preventive services (24 percent). Reproductive health issues accounted for 12 percent of clinic visits (Lear et al., 1991). Forty-six percent of the clinic visits in 1989–1990 lasted more than 20 minutes, compared with an average of 11 minutes per visit to pediatricians (Lear et al., 1991). Thus, SLHCs appear to be providing a wide range of services and dealing with issues, such as mental health, that often tax the experience of the family physician.

However, whether SLHCs actually improve health outcomes (compared with other delivery systems) is an open question. To date, few studies of comprehensive health care centers for adolescents have addressed this issue. One compared hospital-based adolescent health care clinics with clinics that did not have a special focus on adolescents, finding no outcome differences between the two groups after one year (despite the fact that the adolescent clinics were better at identifying problems and had better treatment capabilities) (Earls et al., 1989). However, hospital-based clinics are very different from school-based centers, and the results of this study may not generalize to SLHCs.

Two recent evaluations examined SLHC effectiveness. One showed a 30-percent decline in the pregnancy rate among sexually active females in the SLHC schools compared with a 57-percent increase for those in the comparison schools over a three-year period (Zabin et al., 1986). The other evaluation, which assessed a variety of health behaviors (sexual activity, rate of contraceptive use, absenteeism, cigarette-smoking, and illegal drug use), found few consistent differences between six SLHCs and four comparison schools. The authors concluded that SLHCs "cannot effectively address any difficult social problem in

isolation" and called for improvements that involve parents, community agencies and leaders, religious groups, and the media (Kirby, Waszak, and Ziegler, 1989). Other evaluations are still in progress (Lear et al., 1991).

5. Treatment for and Prevention of High-Risk Behaviors and Mental Disorders

Treatment for substance abuse and mental disorders among adolescents has failed to make the national agenda. The federal government's budget for curbing drug use has been dominated by law enforcement programs, with funding for drug use treatment and prevention lagging far behind. Medicaid benefits appear to foster inpatient treatment for both problems (not necessarily the most appropriate approach for adolescents and probably the most expensive). The Alcohol, Drug Abuse, and Mental Health (ADM) Block Grant Program for outpatient services has had only "symbolic" funding for children's services (OTA, 1991b). In addition, few programs provide drug treatment designed specifically for adolescents (as opposed to mixing adolescents into programs for adults or children), and even fewer take into account the likely co-occurrence of mental health and substance abuse problems in this population. Nevertheless, those that do serve an adolescent population account for almost half the 272,000 young people who are treated for substance abuse each year (OTA, 1991b).

Evaluations of drug treatment programs have largely ignored adolescents. Furthermore, many have focused on programs for adult heroin addicts, with fewer assessments of programs for dependence on marijuana, cocaine, and other illicit drugs that adolescents are more likely to use. In general, such research suggests that a variety of approaches have some effect, that treatment may help reduce levels of use but is less likely to succeed at inducing abstinence, that relapses are common, and that results improve the longer the patient stays in treatment (National Academy of Sciences [NAS], 1990). Even for adults, there is little agreement about the efficacy of various approaches (other than methadone maintenance), how long treatment should last, or what kind of patients should receive which regime.

Money for evaluating adolescent drug treatment has been particularly scarce. Only one national study has been funded; it is still in its initial stages. Critical reviews of the few studies that have been done typically conclude that existing evaluations lack the rigor and longitudinal data required for drawing policy-relevant conclusions (Catalano et al., 1990–91; NAS, 1990; Winters and Henly, 1988). In addition, data on factors that predict completion of treatment (being white, being younger, starting drug use later, not using multiple drugs, not being depressed, etc.) suggest that those who drop out may be the very adolescents

most in need of help. Hence, we still know next to nothing about whether treatment programs really do work for adolescents and, if they do, what features or approaches are most effective.

Evaluations of mental health services for adolescents have not been much better. The fragmentation of services across multiple jurisdictions (mental health systems, social services, juvenile justice, schools, and substance abuse programs) exacerbates the difficulty of developing cross-cutting assessments, as well as the problems of obtaining comprehensive and coordinated care. Among the more innovative mental health programs that have received some assessment are home-based programs, therapeutic foster care, and therapeutic group homes. Studies of home-based programs suggest that they are successful in avoiding placement outside the home (Hinckley and Ellis, 1985; Hobbs, 1982), but the lack of appropriate comparison groups makes such conclusions tentative at best. Therapeutic foster care, provided within the homes of trained families, appears to help adolescents live in less restricted settings one to two years after discharge from care and to attend school or work. However, assessments of these programs have also lacked adequate control or comparison groups (OTA, 1991b). Methodological flaws also plague studies of therapeutic group homes, and some of the studies suggest that gains made during treatment erode after discharge (Kirigin et al., 1982).

Lacking solid evidence that treatment works, some policymakers have concluded that "after-the-fact" interventions provide too little too late. Their concerns have fueled the development and testing of programs designed to prevent or curb various high-risk behaviors before the young person gets in serious trouble. Drug prevention programs, including those aimed solely at cigarettes, are among the most rigorously evaluated of such efforts. Early efforts were aimed primarily at providing information about drug use consequences, fostering self-esteem, and/or developing better communication and decisionmaking skills; they were largely ineffectual (Goodstadt, 1980). More recent "social influence" programs that combine motivational components with specific skills for resisting pro-drug pressures have had greater success (Botvin et al., 1990; Dielman, Shope, and Butchart, 1989; Ellickson and Bell, 1990a, b; Pentz et al., 1989).

In what is one of the more rigorous experimental tests to date, Ellickson and Bell (1990a, b) concluded that school-based prevention programs using the social influence model could curb both cigarette and marijuana use, work in high- and low-minority schools, and help both high- and low-risk adolescents. Nevertheless, they also found only short-lived gains for alcohol prevention and, once the lessons ended, an erosion of all program effects on behavior (Ellickson, Bell, and McGuigan, 1993). Their results are consistent with those for several

antismoking trials, which have been able to delay or curb cigarette use for one to two years but typically did not sustain the effects in the absence of continued booster lessons (Glynn, 1989). The overall findings suggest the need for additional prevention efforts during the high school years and for greater attention to preventing the harms associated with high-risk drinking.

Results for pregnancy prevention programs are encouraging but less consistent. Such programs include those aimed at deterring or delaying sexual activity, as well as those that try to encourage responsible sexual behavior (i.e., contraceptive use) among the sexually active. Some try to do both. As with drug prevention and other endeavors, researchers have found that increasing knowledge about sexual behavior and reproduction is relatively easy to accomplish, whereas modifying attitudes is slightly more difficult. Changing behavior is the most difficult to achieve of the three objectives.

As with drug prevention, programs that combine presentation of motivational material with building of appropriate skills (being able to resist pressures to have sex or to have unprotected sex) appear to do better than those aimed solely at sex education (Kirby, 1989; Howard and McCabe, 1990; and Barth et al., forthcoming). Nevertheless, the more rigorous studies report little difference in sexual activity or pregnancy rates between treatment and control group or comparison group students (Bárth et al., forthcoming; Kirby, 1984) or find behavioral effects only for the previous noninitiates (Howard and McCabe, 1990). A North Carolina program that combined school-based sex education with additional media messages and minicourses at churches and community agencies appeared to slow pregnancy for three years but then lost its effectiveness. The evaluators suggest that a key element in the program's early success was the provision of condoms by the school nurse, which stopped after the state banned condom distribution in school-based clinics (Koo and Dunteman, 1990).

The findings from the latter study suggest that providing and encouraging condom use may be a useful approach for preventing AIDS, as well. To date, however, few prevention programs aimed at AIDS reduction have been systematically evaluated. Many programs aimed at adolescents in general or those in school (e.g., the Centers for Disease Control's multimedia campaign) have had no assessment or have been assessed on the program's effect on AIDS knowledge and attitudes but not its inculcation of risk-reduction behaviors, such as using condoms. Nevertheless, we know that adolescents experience multiple barriers to condom use—embarrassment at buying or using them, beliefs that using condoms reduces pleasure, difficulty in locating them in stores, concern about how others will respond, etc. (Hingson et al., 1990; Kisker, 1985).

Efforts to reduce such barriers may have an effect, therefore. One such program has reported positive results for runaway teens (more consistent condom use, less high-risk sexual behavior), with better outcomes for those who received a greater number of intervention sessions (Rotheram-Borus et al., 1991). To develop and test programs of this nature for teens in general, however, evaluators must overcome community opposition to both frank discussion of sexual matters and the provision of contraceptives to teenagers. As the North Carolina example indicates, doing so is not a simple task. Only a handful of school districts have taken steps to make condoms available to high school students. Indeed, the primary obstacle to establishing school-linked health clinics has been community opposition to family planning and teaching adolescents about using contraceptives; similarly, government funding for programs that acknowledge adolescent sexuality and deal realistically with the concerns and problems of sexually active teenagers has been limited.

6. Future Research Needs

Teenagers who experience mental disorders and/or engage in high-risk behaviors constitute a surprisingly large proportion of the adolescent population. Approximately one in five adolescents suffers from a diagnosable mental disorder; by the time they are seniors, nearly the same number are en route to a long-term smoking career and about 30 percent engage in binge-drinking. More than half of American high schoolers are sexually active, and almost 20 percent have had four or more partners; many sexually active teens do not use condoms or other contraceptive devices consistently. Slightly over one-fourth of ninth- to twelfth-graders report carrying a weapon within the last month.

Engaging in high-risk behavior during the adolescent years can have long-lasting consequences—the responsibilities of teenage parenthood (often combined with restricted life options); the suffering of those with AIDS or other STDs; the risk of death or injury from alcohol- or drug-related accidents, violence, or drug overdoses; the long-term illnesses associated with smoking and alcoholism; and the increased likelihood of unstable employment, broken marriages, and emotional distress associated with chronic drug abuse. Untreated mental disorders can develop into life-threatening problems or severely impede the young person's ability to negotiate the developmental tasks of adolescence and become a productive and well-adjusted adult.

Although low-income teens are more vulnerable to some of the problems associated with high-risk behavior (pregnancy, AIDS, death by homicide), neither the behaviors nor their consequences are confined to a specific group. Black females are more likely to become pregnant than white or Hispanic females, and black males are more likely to be shot than white males. White males, on the other hand, are more likely to commit suicide than any other group, and both white male and female teenagers, as well as Hispanics, have higher rates of alcohol and other drug use than black males and females. Middle-class white females are the most likely to suffer from eating disorders.

Teens with multiple problems face even greater odds of harm. One study estimates multiple-problem youths at close to 25 percent of the adolescent population (Dryfoos, 1990); another study, with far more stringent criteria for what constitutes a problem, puts the figure closer to 2 percent (Elliott, Huizinga, and Menard, 1989). Whatever the correct proportion, the conclusion of this

review is clear: The health and well-being of American teenagers are threatened by much more than physical disease, and our ability to identify, prevent, and cure the sources of the new morbidity is severely limited.

The relatively poor performance of treatment and prevention efforts aimed at high-risk behaviors and mental disorders stems, in part, from the complex causality of such problems. Numerous factors have been identified as contributors to drug use, suicide, risky driving, poor mental health, violence, and early or high-risk sexual activity. Risk or protective factors that are bound up with familial dynamics or school experiences are difficult to modify; they are often beyond the province of the health care providers who see adolescents when they happen to show up in their office or clinic. Nor can individual providers single-handedly alter societal norms that contribute to teenage drug use, violence, and high-risk sex.[1]

Both prevention and treatment have typically focused on helping the adolescent learn how to avoid high-risk behaviors and/or cope with family stress and other environmental problems. Fewer programs have tried to modify familial, school, or societal factors that help create vulnerable teenagers. Yet, trying to "fix the kid" without also fixing the institutions that contribute to poor adjustment and problem behavior limits our ability to make major inroads on adolescent morbidity and mortality.

Viewing the new morbidity as a public health problem opens the door to coordinated prevention and treatment efforts that may involve families, schools, community agencies, and the media, as well as health professionals. Such coordination is essential if we are to address the multiple forces that foster emotional and behavioral problems. Rather than fostering hospitalization as the dominant strategy for treating teenagers with mental health or substance abuse problems, we need to promote community-based or school-linked systems of care that recognize the interrelatedness of many adolescent problems. Such systems should provide integrated services for both family and child; they also need to overcome the fragmentation caused by multiple and overlapping delivery.

For prevention programs aimed at entire cohorts of adolescents, as well as early intervention efforts for younger children, including schools in a coordinated

---

[1]However, they can act in concert with each other and with public health agencies to promote different norms. Combined with nationwide media campaigns, the efforts of professional and laypeople to publicize the Surgeon General's reports on smoking (and later to regulate public smoking) clearly contributed to the declining prevalence and acceptability of cigarette-smoking in the United States (Warner, 1977, 1981, 1989).

program is particularly important. Schools are where most children can be found and where problems can be identified before they become critical. Moreover, we know that at the same time some school environments exacerbate emerging problems, others provide countervailing social climates or rewards for productive behavior. Hence, efforts to modify school practices and norms may help curb high-risk behavior.

Better training in adolescent medicine, including how to communicate with teenagers, may improve the health professional's ability to identify and cope with mental disorders, sexually at-risk teens, and drug abuse. Being able to see the doctor in a setting that fosters communication between health care provider and patient (teen clinics, school-linked health clinics, community-based centers) clearly helps teens talk more freely about personal matters, respond more positively to the doctor, and feel more satisfied with the quality of care received (Ershoff et al., 1992).

If they lack the insurance coverage to get through the door, however, few teens will benefit from greater professionalism and more coordinated services. Current efforts to reform the health care system should aim at reducing the number of uninsured and underinsured adolescents and at providing a basic floor of preventive and mental health services for behavioral, emotional, and physical problems.

Making substantial inroads on the components of the new morbidity will also require a deeper understanding of how such problems arise and the kind of programs that help prevent or cure them. Below, we list research efforts that we believe will further these goals—and should receive high priority.

Clarifying the Causes and Course of Risky Behavior and Mental Health Problems

Many high-risk behaviors appear to have common antecedents and to occur together. This review has repeatedly mentioned early age of onset as a key risk factor for suffering negative consequences from sexual activity, smoking, drinking, and use of other drugs. Similarly, peer and parental modeling and tolerance of particular behaviors (drinking, sexual promiscuity, etc.) foster their initiation and continuation, as do personal beliefs that the benefits outweigh the costs, that "everyone does it," and that one cannot successfully change established behavior patterns or resist pressures to take risks. Young people who engage in high-risk activities are also more likely to come from dysfunctional

families or families with poor parent-child relationships, to do poorly in school, and to have low career and/or academic expectations (Ellickson and Hays, 1992).

These commonalities have led some observers to argue for integrated prevention programs targeted at several adolescent problems, rather than at just one or two. But few programs actually attempt to do so. Why is that the case? One answer may lie in the different developmental ages at which adolescents typically begin experimenting with drugs, sex, and violence. Teens try alcohol and cigarettes before they try marijuana; they usually try marijuana before they try hard drugs. For most, becoming sexually active appears to lag behind initial drug use and minor delinquency (Elliott and Morse, 1992). Hence, efforts aimed at delaying or deterring drug use should be timed somewhat earlier than those aimed at postponing or altering adolescent sexual behavior.

In addition, many of the "common" antecedents listed above (such as parental or peer modeling of the behavior) are actually linked with particular behaviors in highly specific ways. Although many studies identify parental drinking as a spur to teenage drinking, they do not implicate parental drinking in their offspring's cigarette use. Specific beliefs about the harms of cigarette use may discourage teens from smoking, but concerns about drinking and driving do not. Hence, analyses of how these behaviors arise also argue for some programmatic differentiation in trying to curb specific high-risk activities.

Nevertheless, pinning down the degree to which adolescent problem behaviors have common or unique roots would help us clarify what kind of risk factors might be amenable to more generic programmatic efforts and at what point in the child's development such an approach would be most effective. One area that is ripe for serious study involves childhood antecedents of adolescent problems. Many studies have suggested, for example, that children with conduct disorders in elementary school, as well as those with low school performance and attachment, are more likely to become delinquents or drug users later on (Hawkins et al., 1986; Brickman et al., 1984; DiMilio, 1989). Others cite "buffering" personality characteristics that prevent later dysfunction—being emotionally stable and easygoing, having high self-efficacy—or different aspects of family relationships—family cohesiveness and closeness, and having authoritative parents who are warm and demanding but who also give the child psychological autonomy (Baumrind, 1967; Hauser and Greene, 1990; Hill, 1980; Maccoby and Martin, 1983; Compas, 1987; Hauser et al., 1991; Rutter, 1985; Werner and Smith, 1982).

Many separate studies provide pieces of the puzzle; however, we need integrated research that will assess precisely how much early childhood factors actually

contribute to different high-risk behaviors in adolescence, which factors are the most important, and whether those factors are more or less important than differences that emerge during adolescence. Ellickson and Hays (1992) have argued that weak family and school bonds contribute to later adolescent drug use, but that they do so indirectly, through their impact on the child's likely exposure and vulnerability to deviant peers. Because the predictive influence of the familial and school variables is weak, research results suggest that improving family and school bonds would have minimal positive effect on later drug use. But such efforts would be more justifiable if they contributed to the dimunition of other problems. To make progress in clarifying this issue, we need longitudinal analyses that tap various aspects of the child's psychological makeup, familial environment, and school experiences over time, assessing their unique and combined contribution to later problems.

We also need assessments to compare the predictive power of the early antecedents with risk and protective factors that typically come to the fore during the adolescent years, such as peer and parental modeling of high-risk behavior, beliefs about the consequences of such activities, and sensation-seeking. Studies that predict later trouble based solely on early childhood traits and conditions run the risk of overstating the case for the early factors. Conversely, those that focus solely on characteristics measured during adolescence, ignoring early familial or school strains and buffers, may overstate the case for what happens during the adolescent years.

In addition, we need to include both violent and sexual behavior explicitly in such longitudinal analyses. While much of the work on delinquent behavior is relevant to the study of adolescent violence (because violent delinquent acts are included in the delinquent indices), we still need to untangle the specific antecedents and course of violent behavior from the causes and course of delinquency. Such efforts should also evaluate the unique contribution of neighborhood environments to violent acts.

Longitudinal studies of sexual behavior are particularly rare, primarily because of the barriers against asking young people questions about sexual practices. Requirements to obtain active parental consent may reduce the sample size dramatically or cut the study off before it begins. The gaps in our knowledge about patterns of sexual activity are especially great for adolescents under the age of 15. Yet today's problems of AIDS and teenage pregnancy make it all the more imperative to develop the empirical base for understanding the causes and course of early sexual activity. Efforts to revive the proposed nationwide survey of adolescent sexual behavior should also advocate adding a longitudinal panel to the study that includes young adolescents.

Testing Strategies for Prevention and Treatment

Reducing the Risk of AIDS and Teenage Pregnancy

The basic research described above will yield a stronger theoretical and empirical foundation for developing more effective interventions; however, we should not forgo testing plausible approaches now. Of particular importance is the urgent need to evaluate AIDS risk-reduction strategies for adolescents. Such strategies include prevention programs for the general adolescent population as well as those for teens who are at high risk because they are already sexually active or use IV drugs. We discuss two plausible approaches below.

Prevention evaluations have repeatedly concluded that information alone rarely produces behavior change. Nevertheless, most AIDS prevention programs have not moved beyond providing information about modes of transmission and ways to reduce the risk. Recognizing this deficiency, several analysts have suggested the development and testing of AIDS reduction programs that draw on the health belief model, self-efficacy theory, and social learning theory (Hingson et al., 1990; Becker and Joseph, 1988; Catania, Kegeles, and Coates, 1990). Prevention efforts derived from these theories, referred to as the "social influence model" in drug prevention studies, have had some success at deterring drug use (Ellickson and Bell, 1990a; Shope et al., 1992; Pentz et al., 1989) and merit adaptation to AIDS. Other researchers have argued for more general competence enhancement approaches that include basic personal and social skills (Botvin and Dusenbury, 1992). Such approaches add general life skills to the specific motivational and skill-building components of the first model and merit adaptation to AIDS reduction, as well.

For teens who are already sexually active (or in high school or living in areas where sexual initiation typically occurs before high school), we would argue that relevant adaptations must include training (role-playing, video instruction, etc.) in how to practice safe sex—including getting condoms, asking that a condom be used, and using one.[2] This guideline does not preclude also teaching teens how to resist offers of sex (as well as why doing so may be preferred). Clearly, sexually active adults, as well as adolescents, benefit from both skills.

---

[2]High-risk teens who use IV drugs also need to learn how to avoid drug use practices, such as needle-sharing, that increase the risk of AIDS. Programs for IV drug users and other high-risk teens, such as runaways and homeless adolescents, should be tailored to their behavior and targeted specifically to them.

Because AIDS has consequences that are both immediately relevant and deadly to young people, AIDS reduction programs may have less difficulty motivating teens to practice safer sex than has been the case for resistance motivation in anti-drug programs. At the same time, however, it may be quite difficult to help teens develop and use the skills required to act on that motivation (while teens may say they would not be embarrassed if a partner suggested using a condom, how they would actually respond in a real-life situation and whether they would make the request themselves are another matter). Hence, evaluations should pay particular attention to which components of the prevention program are more or less effective and what modifications may improve their efficacy.

AIDS reduction trials that encourage safer sex through the use of condoms also have the advantage of promoting practices that reduce the risk of teenage pregnancy. Such trials should use that advantage as a springboard to discuss other issues surrounding reproduction and appropriate contraceptive practice. Because teens who have been drinking or using drugs may be less likely to use condoms, drug prevention techniques should also be included as part of an AIDS reduction program.

Testing Early Interventions

Interventions that help schools and families strengthen the younger child's resilience and competence have intuitive appeal as ways to provide a solid foundation for long-term health. Elementary schools, which have access to the general population of children for several years, are logical venues for such efforts. From a developmental point of view, the child's early socialization occurs within the family and then at school; hence, strengthening the child's bonds with both institutions during this formative period makes sense. Targeting the whole school also avoids the possible problem of stigmatizing children singled out for extra help.

To date, however, we have little information about whether the "solid foundation" approach really works. Programs using this approach typically have a broad agenda that includes changing how schools and/or families function. For example, one well-known program seeks to restructure elementary schools through the use of programs tailored to each child, parental involvement in school governance, and the provision of mental health services for children, staff, and parents. It has shown positive effects on attendance, math and reading skills, and achievement test scores in at least three different evaluations (Comer, 1985, 1988). However, the number of schools involved in such studies was small (between 2 and 10) and the schools were not randomly assigned to experimental

conditions. Those deficiencies have been corrected in an ongoing test of the Comer approach in a large number of middle schools. This study will provide rigorous information across a variety of outcome variables, but it does not include elementary schools. A rigorous experimental trial of Comer's approach is needed at the elementary school level.

Another strategy for strengthening the child's bonds with family and the school was launched in Seattle in 1981. Developed by Hawkins and colleagues, the elementary school program includes parent and teacher training, conflict-resolution services for high-risk children, and home-school liaison services. Early analyses suggest that it has curbed aggressive behavior among white boys and self-destructive behavior among white girls but had no effect on black children (Hawkins, Von Cleve, and Catalano, 1991). These results highlight the difficulty of altering behaviors that are the product of multiple influences, even when efforts are made to improve the institutional environments that appear to shape them. They also point up the need for comparative assessments across different ethnic groups.

Evaluating Treatment Programs for Adolescents

Because we lack information about the efficacy of various drug treatment regimes with adolescent patients, we cannot judge which ones to promote or identify ways to improve them. Clinical trials that provide data on the comparative efficacy of different programs compared with no program at all are extremely rare in this field; hence, we need studies that employ random assignment of patients to treatment and control conditions. Because relapse is such a common occurrence, such studies should follow subjects for several years, adjusting for attrition and recording the results of urine or other physiological testing, as well as self-reported use. Care should be taken to assess the developmental appropriateness of the program for its target age group and, if the age range covers several years, to analyze results for early, middle, and late adolescents separately.

Similar evaluations are needed for treatment regimes designed to alleviate mental disorders, particularly those for the dually diagnosed (adolescents who also exhibit substance abuse problems). As with drug treatment trials, the crucial requirement for these evaluations is being able to compare adolescents who received the treatment with a similar group of candidate patients who did not. Random assignment is the best method for getting an accurate test of the treatment's outcome; lacking that option, using a well-matched comparison

group in addition to the treatment group is an acceptable but second-best alternative.

For both types of evaluations, concerns about the validity and reliability of the outcome measures must be addressed. For drug use outcomes, physiological samples typically act as the "gold standard" for detecting recent use but are less helpful for describing drug use histories. Self-report data typically supply the latter information; self-reports should be compared with the lab results and evaluated for consistency and reliability over time.

The issue of how best to measure mental health outcomes is yet to be resolved. There are a number of different instruments, ranging from diagnostic interviews performed by a trained professional to paper-and-pencil scales filled out by the subject, his parent, or his teacher. Lack of agreement between different respondents, such as parent and teacher or parent and child, has contributed to concerns about the need for a reliable and valid standardized instrument for studying large populations. It is hoped that the new Diagnostic Interview for Children (DIS-C), currently being tested, will be that instrument. However, studies that compare the DIS-C's performance across children from different ethnic and socioeconomic groups are particularly needed. Evaluation of the DIS-C against other epidemiological and clinical measures will also be required.

Conclusions

The research program outlined above is designed to provide needed information for improving adolescent well-being through a two-pronged effort: one line of work aiming to deepen our understanding of the causes and course of high-risk behaviors and mental disorders that threaten adolescent health, the other line of work testing promising interventions for preventing or treating those problems. It is by no means an exhaustive research agenda, and others would surely have different recommendations and priorities.

Our choice of promising interventions is guided by the belief that no one strategy will ensure success: Preventing or curbing the problems described requires programs designed for young children as well as for adolescents. If we have learned anything over the years, it is that we should not expect to get large, or lasting, effects from short-term efforts. Complex problems require multipronged solutions. Booster programs are needed to sustain early gains; programs for younger children need to be followed by developmentally appropriate programs for older children and adolescents.

We need to find out whether interventions designed to enhance the young child's ability to overcome obstacles and to foster a sense of competence and being cared for will, in fact, strengthen the adolescent's mental health and reduce his or her vulnerability to problem-prone behavior. We also need to find out whether such efforts obviate the need for prevention programs during adolescence or provide the base for enhancing their effectiveness. Making a sound investment in our children's health requires accurate information for deciding how to do it.

References

Adams, D. M., and J. C. Overholser, "Suicidal Behavior and History of Substance Abuse," *American Journal of Drug and Alcohol Abuse*, 18(3):343–354, 1992.

Alan Guttmacher Institute, *Teenage Pregnancy in the United States: The Scope of the Problem and State Responses*, New York: Alan Guttmacher Institute, 1989.

Alcohol, Drug Abuse, and Mental Health Administration [ADAMHA], *Report of the Secretary's Task Force on Youth Suicide*, Washington, D.C.: Government Printing Office, DHHS Publication (ADM) 89-1624-1, 1989.

American Academy of Pediatrics, *Guidelines for School-Based Health Clinics*, Elk Grove Village, Ill.: American Academy of Pediatrics, 1987.

American School Health Association, Association for the Advancement of Health Education, Society for Public Health Education, Inc., *The National Adolescent Student Health Survey: A Report on the Health of America's Youth*, Oakland, Calif.: Third Party Publishing, 1989.

Anderson, A. E., and A. E. Mickalide, "Anorexia Nervosa in the Male," *Psychometrics*, 24:1066–1074, 1983.

Apter, A., et al., "Suicidal Behavior, Depression, and Conduct Disorder in Hospitalized Adolescents," *Journal of the American Academy of Child and Adolescent Psychiatry*, 27:696–699, 1988.

Barth, R. P., et al., "Preventing Teenage Pregnancy with Social and Cognitive Skills," *Journal of Adolescent Research*, forthcoming.

Battjes, R. J., C. G. Leukefeld, and R. W. Pickens, "Age at First Injection and HIV Risk Among Intravenous Drug Users," *American Journal of Drug and Alcohol Abuse*, 18(3):263–273, 1992.

Baumrind, D., "Child Care Practices Anteceding Three Patterns of Pre-School Behavior," *Genetic Psychology Monographs*, 75:43–88, 1967.

Becker, M., and J. Joseph, "AIDS and Behavioral Change to Avoid Risk: A Review," *American Journal of Public Health*, 78:384–410, 1988.

Bird, H. R., et al., "Estimates of the Prevalence of Childhood Maladjustment in a Community Survey in Puerto Rico," *Archives in General Psychiatry*, 45:1120–1128, 1988.

Blum, R., "Continuing Education in Adolescent Health Care: Reaching Professionals in Practice," *Proceedings of the Health Futures of Adolescents National Invitational Conference*, Daytona Beach, Fla., 1986.

———, "Physicians' Assessments of Deficiencies and Desire for Training in Adolescent Medicine," *Journal of Medical Education*, 62(5):401–407, 1987.

Botvin, G. J., and L. Dusenbury, "Substance Abuse Prevention: Implications for Reducing Risk of HIV Infection," *Psychology of Addictive Behaviors*, 6(2):70–80, 1992.

Botvin, G. J., et al., "Preventing Adolescent Drug Abuse Through a Multimodal Cognitive Behavioral Approach: Results of a 3-Year Study," *Journal of Consulting and Clinical Psychology*, 58(4):437–446, 1990.

Brickman, A. S., et al., "Neuropsychological Assessment of Seriously Delinquent Adolescents," *Journal of the American Academy of Child and Adolescent Psychiatry*, 23:453–457, 1984.

Cantwell, D. P., "Genetics of Hyperactivity," *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 16(3):261–264, 1975.

Catalano, R., et al., "Evaluation of the Effectiveness of Adolescent Drug Abuse Treatment, Assessment of Risks for Relapse, and Promising Approaches for Relapse Prevention," *International Journal of the Addictions*, A25(9–10):1085–1140, 1990–91.

Catania, J., S. Kegeles, and T. Coates, "Towards an Understanding of Risk Behavior: An AIDS Risk Reduction Model (ARRM)," *Health Education Quarterly*, 17(1):53–72, 1990.

Centers for Disease Control (CDC), "Homicide Among Young Black Males—United States, 1978–1987," *Morbidity and Mortality Weekly Report*, 39(48):869–873, 1990.

———, "Weapon-Carrying Among High School Students—United States, 1990," *Morbidity and Mortality Weekly Report*, 40:681–684, 1991.

———, "Sexual Behavior Among High School Students—United States, 1990," *Morbidity and Mortality Weekly Report*, 40(51–52):885–888, 1992a.

———, "Attempted Suicide Among High School Students," *Morbidity and Mortality Weekly Report*, 40(37):633–635, 1992b.

———, "HIV Instruction and Selected HIV-Risk Behaviors Among High School Students—United States, 1989–1991," *Morbidity and Mortality Weekly Report*, 41(46):866–868, 1992c.

Chang, G., V. Warner, and M. Weissman, "Physicians' Recognition of Psychiatric Disorders in Children and Adolescents," *American Journal of Diseases of Children*, 142(7):736–739, 1988.

Chassin, L., "Adolescent Substance Use and Abuse," in P. Karoly and J. J. Steffen, eds., *Advances in Child Behavioral Analysis and Therapy, Vol. 3: Adolescent Behavior Disorders—Foundation and Contemporary Concerns*, Lexington, Mass.: Lexington Books, 1984, pp. 99–153.

Clayton, R. R., A. Cattarello, and K. P. Walden, "Sensation Seeking as a Potential Mediating Variable for School-Based Prevention Interventions: A Two-Year Followup of DARE," *Health Communication*, 3(4):229–239, 1991.

Cleary, P. D., et al., "Adolescent Smoking: Research and Health Policy," *Milbank Quarterly*, 66(1):137–171, 1988.

Cohen, P., et al., "Diagnostic Predictors of Treatment Patterns in a Cohort of Adolescents," *Journal of American Academy of Child Adolescent Psychiatry*, 30:989–993, 1991.

Coles, R. E., "Children Who Become Parents: A Challenge to Physicians," 22:20–24, 1990.

Comer, J. P., "Educating Poor Minority Children," *Scientific American*, 24:154–160, 1985.

———, "The Yale–New Haven Primary Prevention Project: A Follow-Up Study," *Journal of American Academy of Child Psychiatry*, 259:42–48, November 1988.

Compas, B. E., "Coping with Stress During Childhood and Adolescence," *Psychological Bulletin*, 101:393–403, 1987.

Cooper, P. J., and C. G. Fairburn, "Binge-Eating and Self-Induced Vomiting in the Community," *British Journal of Psychiatry*, 142:139–144, 1983.

———, "The Depressive Symptoms of Bulimic Nervosa," *British Journal of Psychiatry*, 148:268–274, 1986.

Costello, E. J., "Child Psychiatric Disorders and Their Correlates: A Primary Care Pediatric Sample," *Journal of the American Academy of Child and Adolescent Psychiatry*, 28:851–855, 1989.

Costello, E. J., C. Edelbrock, and A. Costello, "Psychopathology in Pediatric Primary Care: The New Hidden Morbidity," *Pediatrics*, 82(3, pt. 2): 415–424, 1988.

Deykin, E., J. C. Levy, and V. Wells, "Adolescent Depression, Alcohol, and Drug Abuse," *American Journal of Public Health*, 76:178–182, 1987.

Diagnostic and Statistical Manual of Mental Disorders, 3rd ed., revised [DSM III-R], Washington, D. C.: American Psychiatric Association, 1987.

Dielman, T. E., J. T. Shope, and A. T. Butchart, "Differential Effectiveness of an Elementary School-Based Alcohol Misuse Prevention Program by Type of Prior Drinking Experience," *Journal of School Health*, 59(6):255–263, 1989.

DiMilio, L., "Psychiatric Syndromes in Adolescent Substance Abusers," *American Journal of Psychiatry*, 146:1212–1214, 1989.

Dryfoos, J., *Adolescents at Risk: Prevalence and Prevention*, New York: Oxford University Press, 1990, p. 280.

———, "Schools as Places for Health, Mental Health, and Social Services," *Teachers College Record*, 94(3):540–567, Spring 1993.

Earls, F., et al., "Comprehensive Health Care for High-Risk Adolescents: An Evaluation Study," *American Journal of Public Health*, 79(8):999–1005, 1989.

Ellickson, P. L., "School-Based Drug Prevention: What Should It Do? What Has It Done?" in R. Coombs and D. Ziedonis, eds., *Handbook on Drug Abuse Prevention*, Englewood Cliffs, N. J.: Prentice-Hall, forthcoming.

Ellickson, P. L., and R. M. Bell, "Drug Prevention in Junior High: A Multi-Site Longitudinal Test," *Science*, 247:1299–1305, 1990a.

———, *Prospects for Preventing Drug Use Among Young Adolescents*, Santa Monica, Calif.: RAND, R-3896-CHF, March 1990b.

Ellickson, P. L., R. M. Bell, and K. McGuigan, "Preventing Adolescent Drug Use: Long-Term Results of a Junior High Program," *American Journal of Public Health*, 83(6):856–861, 1993.

Ellickson, P. L., and R. D. Hays, "On Becoming Involved with Drugs: Modeling Adolescent Drug Use Over Time," *Health Psychology*, 11(6):377–385, 1992.

Ellickson, P. L., R. D. Hays, and R. M. Bell, "Stepping Through the Drug Use Sequence: Longitudinal Scalogram Analysis of Initiation and Regular Use," *Journal of Abnormal Psychology*, 101(3):441–451, 1992.

Ellickson, P. L., et al., *Designing and Implementing Project ALERT, a Smoking and Drug Prevention Experiment*, Santa Monica, Calif.: RAND, R-3754-CHF, December 1988.

Elliott, D. S., D. Huizinga, and S. S. Ageton, *Explaining Delinquency and Drug Use*, Beverly Hills, Calif.: Sage Publications, 1985.

Elliott, D. S., D. Huizinga, and S. Menard, *Multiple Problem Youth: Delinquency, Substance Use, and Mental Health Problems*, New York: Springer-Verlag, 1989.

Elliott, D. S., and B. J. Morse, "Drug Use, Delinquency and Sexual Activity," in C. L. Jones, ed., *Drug Abuse and Adolescent Sexual Behavior, Pregnancy, and Parenting*, Washington, D. C.: National Institute on Drug Abuse, Alcohol,

Drug Abuse, and Mental Health Administration, Public Health Service, U. S. DHHS, 1992.

Elliott, G. R., and S. S. Feldman, eds., *At The Threshhold: The Developing Adolescent*, Cambridge, Mass.: Harvard University Press, 1990.

Ershoff, D., et al., "Meeting the Special Needs of Adolescents in an HMO Setting: Patient Satisfaction with a Comprehensive Teen Clinic Versus Traditional Primary Care," Presentation at the Annual Meeting of the American Public Health Association, Washington, D.C., November 9, 1992.

Famularo, R., K. Stone, and C. Poppes, "Preadolescent Alcohol Abuse and Dependence," *American Journal of Psychiatry*, 140:1187–1189, 1985.

Fichter, M. M., and C. Daser, "Symptomatology, Psychosocial Development and Gender Identity in 42 Anorexic Males," *Psychological Medicine*, 17:409–418, 1987.

Figueroa, E., et al., "Attitudes, Knowledge, and Training of Medical Residents Regarding Adolescent Health Issues," *Journal of Adolescent Health*, 12:443–449, 1991.

Fingerhut, L. A., D. D. Ingram, and J. J. Feldman, "Firearm and Nonfirearm Homicide Among Persons 15 through 19 Years of Age," *JAMA*, 267(22):3048–3053, 1992.

Friedman, I. M. , "Alcohol and Youthful Unnatural Deaths," *Pediatrics*, 76:191–193, 1985.

Friedman, R., and K. Kutash, "Challenges for Child and Adolescent Mental Health," *Health Affairs*, 11(3):125–136, Fall 1992.

Garmezy, H., A. Masten, and A. Tellegen, "The Study of Stress and Competence in Children," *Child Development*, 55:97–111, 1984.

Gispert, M., et al., "Suicidal Adolescents: Factors in Evaluation," *Adolescence*, 20:753–762, 1985.

Glynn, T. J., "Essential Elements of School-Based Smoking Prevention Programs," *Journal of School Health*, 59(5):181–188, 1989.

Goodstadt, M. S., "Drug Education: A Turn On or a Turn Off?" *Journal of Drug Education*, 10:89–99, 1980.

Greenbaum, P. E., et al., "Substance Abuse, Prevalence, and Comorbidity with Other Psychiatric Disorders Among Adolescents with Severe Emotional Disturbances," *Journal of American Academy of Child and Adolescent Psychiatry*, 30:575–583, 1991.

Hansen, W. B., et al., "Affective and Social Influences Approaches to the Prevention of Multiple Substance Abuse Among Seventh Grade Students: Results from Project SMART," *Preventive Medicine*, 17(2):93–114, 1988.

Hauser, S. T., and W. Greene, *Passages from Late Adolescence to Early Adulthood, The Course of Life*, New York: International University Press, 1990.

Hauser, S. T., et al., "Vulnerability and Resilience in Adolescence: Views from the Family," *Journal of Early Adolescence*, 5:81–100, 1985.

———, "Adolescent Ego Development Within the Family: Family Styles and Family Sequences," *International Journal of Behavioral Development*, 14(2):165–193, 1991.

Hawkins, J. D., E. Von Cleve, and R. F. Catalano, Jr., "Reducing Early Childhood Aggression: Results of a Primary Prevention Program," *Journal of American Academy of Child and Adolescent Psychiatry*, 30(2):208–217, 1991.

Hawkins, J., et al., "Childhood Predictors of Adolescent Substance Abuse: Toward an Empirically Grounded Theory," *Journal of Children in Contemporary Society*, 8(1):11–47, 1986.

Health Promotion, "Ottawa Charter for Health Promotion," 1(4):iii–v, 1987.

Heller, A., et al., "Birth Defects and Psychosocial Adjustment," *American Journal of Diseases of Children*, 139:257–263, 1985.

Henshaw, S. K., and J. Van Vort, "Teenage Abortion, Birth, and Pregnancy Statistics: An Update," *Family Planning Perspectives*, 21(2):85–87, 1989.

Herzog, D. B., et al., "Sexual Conflict and Eating Disorders in 27 Males," *American Journal of Psychiatry*, 141:989–990, 1984.

———, "Eating Disorder and Social Maladjustment in Female Medical Students," *Journal of Nervous and Mental Disorders*, 173:734–737, 1985.

Herzog, D. M., and P. M. Copeland, "Eating Disorders," *New England Journal of Medicine*, 313:295, 1985.

Hill, J. P., "The Family," in M. Johnson, ed., *Toward Adolescence: The Middle School Years*, Seventy-Ninth Yearbook of the National Society for the Study of Education, Chicago: University of Chicago Press, 1980, pp. 32–55.

Hinckley, E. C., and W. F. Ellis, "An Effective Alternative to Residential Placement: Home-Based Services," *Journal of Clinical Child Psychology*, 14(3):209–213, 1985.

Hingson, R., L. Strunin, and B. Berlin, "Five Years After Surgeon General Koop Called for Adolescent AIDS Education: Have Teen Beliefs and Behaviors Changed? A Massachusetts Study," Presentation at the Annual Meeting of the American Public Health Association, Washington, D.C., November 1992.

Hingson, R. W., et al., "Beliefs About AIDS, Use of Alcohol and Drugs, and Unprotected Sex Among Massachusetts Adolescents," *American Journal of Public Health*, 80(3):295–299, 1990.

Hirschi, T., and M. J. Hindelang, "Intelligence and Delinquency: A Revisionist Review," *American Sociological Review*, 42:571–587, 1977.

Hobbs, N., *The Troubled and Troubling Child: Reeducation in Mental Health, Education, and Human Services Programs for Children and Youth*, San Francisco, Calif.: Jossey Bass, 1982.

Hoberman, H. M., and B. D. Garfinkel, "Completed Suicide in Children and Adolescents," *Journal of the American Academy of Child and Adolescent Psychiatry*, 27:689–695, 1988.

Hoekelman, R., et al., "A Profile of Pediatric Practice in the United States," *American Journal of Diseases of Children*, 137(5):1057–1060, 1983.

Howard, M., and J. B. McCabe, "Helping Teenagers Postpone Sexual Involvement," *Family Planning Perspectives*, 22:21–26, 1990.

Johnston, L. D., P. M. O'Malley, and J. G. Bachman, *Drug Use Among American High School Seniors, College Students, and Young Adults, 1975–1990, Vol. I: High School Seniors*, Washington, D.C: National Institute on Drug Abuse, 1991.

Jones, D. L., et al., "Epidemiology of Anorexia Nervosa in Monroe County, New York: 1970–1976," *Psychiatric Medicine*, 42:551–558, 1980.

Jones, J. B., and S. Philliber, "Sexually Active but Not Pregnant," *Journal of Youth and Adolescence*, 12(3):235–251, 1983.

Journal of School Health, "Behaviors Related to Unintentional and Intentional Injuries Among High School Students—United States, 1991," 62(9):439–443, 1992.

Kandel, D., "Stages in Adolescent Involvement in Drug Use," *Science*, 190:912–914, 1975.

Kashani, J. H., and H. Orvaschel, "Anxiety Disorders in Mid-Adolescents: A Community Sample," *American Journal of Psychiatry*, 145:960–964, 1988.

Kashani, J. H., et al., "Depression, Depressive Symptoms, and Depressed Mood Among a Community Sample of Adolescents," *American Journal of Psychiatry*, 145:960–964, 1987.

Keller, M. B., et al., "Impact of Severity and Chronicity of Parental Affective Illness on Adaptive Functioning and Psychopathology in Children," *Archives of General Psychiatry*, 43:930–937, 1986.

Kiesler, C. A., "Public and Professional Myths About Mental Hospitalization: An Empirical Reassessment of Policy-Related Beliefs," *American Psychologist*, 37(12):1323–1339, 1982a.

———, "Mental Hospitals and Alternative Care: Noninstitutionalization as Potential Public Policy for Mental Patients," *American Psychologist*, 37(4):349–360, 1982b.

———, "U.S. Mental Health Policy: Doomed to Fail," *American Psychologist*, 47(9):1077–1082, 1992.

Kilbourne, B. W., J. W. Buehler, and M. F. Rogers, "AIDS as a Cause of Death in Children, Adolescents, and Young Adults," *American Journal of Public Health*, 80(4):499–500, 1990.

Kirby, D., *Sexuality Education: An Evaluation of Programs and Their Effects*, Santa Cruz, Calif.: Network Publications, 1984.

———, "Research on Effectiveness of Sex Education Programs," *Theory into Practice*, 28(3):165–171, 1989.

Kirby, D., C. Waszak, and J. Ziegler, *An Assessment of Six School-Based Clinics: Services, Impact, and Potential*, Washington, D.C.: Center for Population Options, 1989.

Kirigin, K. A., et al., "An Evaluation of the Teaching-Family (Achievement Place) Group Homes for Juvenile Offenders," *Journal of Applied Behavior Analysis*, 15:1–16, 1982.

Kisker, E. E., "Teenagers Talk About Sex, Pregnancy and Contraception," *Family Planning Perspectives*, 17(2):83–90, 1985.

Klerman, L., *Alive and Well? A Research and Policy Review of Health Programs for Poor Young Children*, New York: Columbia University, Center for Children in Poverty, 1991.

Knitzer, J., *Unclaimed Children*, Washington, D.C.: Children's Defense Fund, 1982.

———, *Collaborations Between Child Welfare and Mental Health: Emerging Patterns and Challenges*, New York: Bank Street College of Education, May 1989.

Koo, H. P., and G. H. Dunteman, *Reanalysis of Changes in Teenage Pregnancy Rates in Denmark Area and Comparison Counties*, Research Triangle Park, N.C.: Research Triangle Institute, 1990.

Koop, C. E., and G. D. Lundberg, "Violence in America: A Public Health Emergency," *JAMA*, 267(22):3075–3076, 1992.

Kope, T. M., and W. H. Sack, "Anorexia Nervosa in Southeast Asian Refugees," *Journal of the American Academy of Child and Adolescent Psychiatry*, 26:795–797, 1987.

Kovacs, M., et al., "Depressive Disorders in Childhood, I: A Longitudinal Prospective Study of Characteristics and Recovery," *Archives of the Journal of Psychiatry*, 41:229–237, 1984a.

———, "Depressive Disorders in Childhood, II: A Longitudinal Study of the Risk for a Subsequent Major Depression," *Archives of General Psychiatry*, 41:643–649, 1984b.

———, "Depressive Disorders in Childhood, III: A Longitudinal Study of Comorbidity with and Risk for Conduct Disorders," *Journal of General Psychiatry*, 41:643–649, 1984c.

———, "Depressive Disorders in Childhood, III: A Longitudinal Study of Comorbidity with and Risk for Conduct Disorders," *Journal of Affective Disorders*, 15:205–217, 1988.

Lahey, B. B., et al., "Psychopathology in the Parents of Children with Conduct Disorder and Hyperactivity," *Journal of the American Academy of Child and Adolescent Psychiatry*, 27:163–170, 1988.

Lear, J. G., et al., "Reorganizing Health Care for Adolescents: The Experience of the School-Based Adolescent Health Care Program," *Journal of Adolescent Health*, 12:450–458, 1991.

Lewis, C., "Preventing Traffic Casualties Among Youth: What Is Our Knowledge Base?" *Alcohol, Drugs, and Driving*, 4(1):1–7, 1988.

Loeber, R., and M. Stouthamer-Loeber, "Family Factors as Correlates and Predictors of Juvenile Conduct Problems and Delinquency," in M. Tonry and N. Morris, eds., *Crime and Justice*, Vol. 7, Chicago: University of Chicago Press, 1986, pp. 29–149.

Lovett, J., and M. Wald, "Physician Attitudes Toward Confidential Care for Adolescents," *Journal of Pediatrics*, 106(3):517–521, 1985.

Lynch, F., "Providing Family-Based Services for Children and Adolescents with Mental Health Problems: The Potential of Private Health Insurance," in *Fourth Annual Conference Proceedings: A System of Care for Children's Mental Health: Expanding the Research Base*, Tampa: University of South Florida, 1992.

Maccoby, E., and J. Martin, "Socialization in the Context of the Family: Parent-Child Interaction," in E. M. Hetherington, ed., *Handbook of Child Psychology. Socialization, Personality, and Social Development*, Vol. 4, New York: Wiley, 1983, pp. 1–101.

Mannuzza, S., et al., "Hyperactive Boys Almost Grown Up—V. Replication of Psychosomatic Status," *Archives of General Psychiatry*, 48:77–83, 1991.

Mattison, R. E., "Suicide and Other Consequences of Childhood and Adolescent Anxiety Disorders," *Journal of Clinical Psychiatry*, 49(10, Suppl.):9–11, 1988.

Milin, R., et al., "Psychopathology Among Substance-Abusing Juvenile Offenders," *Journal of the American Academy of Child and Adolescent Psychiatry*, 30:569–574, 1991.

Millstein, S., "The Potential of School-Linked Centers to Promote Adolescent Health and Development," Washington, D.C.: Carnegie Council on Adolescent Development, working paper, August 1988.

Millstein, S. G., and C. E. Irwin; "Accident-Related Behaviors in Adolescents: A Biopsychosocial View," *Alcohol, Drugs, and Driving*, 4(1):21–29, 1988.

Millstein, S. G., and I. F. Litt, "Adolescent Health," in *At the Threshhold: The Developing Adolescent*, Cambridge, Mass.: Harvard University Press, 1990.

Moore, K., *Facts at a Glance*, Washington, D.C.: Child Trends, Inc., 1988.

Mosher, W. D., "Contraceptive Practices in the United States, 1982–1988," *Family Planning Perspectives*, 22(5):198–205, 1990.

Murphy, G. E., "Suicide and Substance Abuse," *Archives of General Psychiatry*, 45:593–594, 1988.

National Academy of Sciences, National Research Council, Commission on Behavioral and Social Sciences and Education, Committee on Child Development Research and Public Policy, Panel on Adolescent Pregnancy and Childbearing, *Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing, Volume I*, C. D. Hayes, ed., Washington, D.C.: National Academy Press, 1987.

National Academy of Sciences, Institute of Medicine, Division of Health Care Services, Committee for the Substance Abuse Coverage Study, *Treating Drug Problems*, Washington, D.C.: National Academy Press, 1990.

National Center for Health Statistics (NCHS), "Utilization of Short-Stay Hospitals, United States," *Vital and Health Statistics*, Hyattsville, Md.: NCHS, 1984 (DHHS [PHS], Publication 86-1745, Series 13, No. 84, 1986).

———, "Summary, National Hospital Discharge Survey," *Advance Data from Vital and Health Statistics*, No. 127, September 25, 1985 (Hyattsville, Md.: Public Health Service, DHHS Publication 86-1250, 1986).

———, "Vital Statistics Mortality Data, Multiple Cause-of-Death Detail" [machine-readable public-use data tape], U.S. Department of Health and Human Services (DHHS), CDC, 1988.

National Institute of Mental Health (NIMH), *National Plan for Research on Child and Adolescent Mental Disorders, a Report Requested by the U.S. Congress*, Submitted by the National Advisory Mental Health Council, U.S. Department of Health and Human Services, 1990.

National Institute on Drug Abuse (NIDA), "A Comparison of Drug Use Among 8th, 10th, and 12th Graders from NIDA's High School Senior Survey," *NIDA Notes*, May/June 1992a.

———, *Smoking, Drinking, and Illicit Drug Use Among American Secondary School Students, College Students, and Young Adults, 1975–1991, Volume 1: Secondary School Students*, Washington, D.C.: Government Printing Office, 1992b.

National Research Council, *Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing: Working Papers*, Washington, D. C.: National Academy Press, 1987.

Neinstein, L. S., and J. R. Shapiro, "Pediatrician's Self Evaluation of Adolescent Health Care Training, Skills and Interest," *Journal of Adolescent Health Care*, 7:18–21, 1986.

Newacheck, P. W., M. A. McManus, and J. Gephart, "Health Insurance Coverage of Adolescents: A Current Profile and Assessment of Trends," *Pediatrics*, 90(4):589, 1992.

Newcomb, M. D., and P. Bentler, *Consequences of Adolescent Drug Use: Impact on the Lives of Young Adults*, Newbury Park, Calif.: Sage, 1988.

Novack, D., et al., "Physicians' Attitude Toward Using Deception to Resolve Difficult Ethical Problems," *Journal of the American Medical Association*, 261(20):2980–2985, 1989.

Office of Technology Assessment (OTA), *Adolescent Health, Volume 1: Summary and Policy Options*, Washington, D.C.: Government Printing Office, April 1991a.

———, *Adolescent Health, Volume 2: Background and the Effectiveness of Selected Prevention and Treatment Services*, Washington, D.C.: Government Printing Office, May 1991b.

———, *Adolescent Health Assessment: Crosscutting Issues in the Delivery of Health Related Services, Volume 3*, Washington, D.C.: Government Printing Office, June 1991c.

Office on Smoking and Health, *Smoking and Health: A National Status Report*, 2nd ed., Rockville, Md.: CDC, DHHS Publication 87-8396, revised 1990.

Offord, D. R., et al., "Ontario Child Health Study: II. Six-Month Prevalence of Disorder and Rates of Service Utilization," *Archives of General Psychiatry*, 44:832–836, 1987.

Omnibus Budget Reconciliation Act, Public Law 101-239, 1989.

Omnibus Budget Reconciliation Act, Public Law 101-508, 1990.

Orr, D. P., et al., "Psychosocial Implications of Chronic Illness in Adolescence," *Journal of Pediatrics*, 104:152, 1984.

Palla, B., and I. F. Litt, "Medical Complications of Eating Disorders in Adolescents," *Pediatrics*, 81:613–623, 1988.

Pentz, M. A., et al., "A Multicommunity Trial for Primary Prevention of Adolescent Drug Abuse," *Journal of the American Medical Association*, 261(22):3259–3266, 1989.

Pfeffer, C. R., et al., "Suicidal Behavior in Latency-Age Children: An Empirical Study," *Journal of the American Academy of Child Psychiatry*, 18:679–692, 1979.

———, "Suicidal Behavior in Latency-Age Children: An Outpatient Population," *Journal of the American Academy of Child Psychiatry*, 19:703–710, 1980.

———, "Suicidal Children Grow Up: Demographic and Clinical Risk Factors for Adolescent Suicide Attempts," *Journal of the American Academy of Child and Adolescent Psychiatry*, 30:609–616, 1991.

Puig-Antich, J., and H. Rabinovich, "Major Child and Adolescent Psychiatric Disorders," in M. D. Levine et al., eds., *Developmental-Behavioral Pediatrics*, Philadelphia: W. B. Saunders, 1983.

Pynoos, R. S., et al., "Life Threat and Posttraumatic Stress in School-Age Children," *Archives of General Psychiatry*, 44:1057–1063, 1987.

Rae-Grant, N., et al., "Risk, Positive Factors, and the Prevalence of Behavioral and Emotional Disorders in Children and Adolescents," *Journal of the American Academy of Child and Adolescent Psychiatry*, 28(2):262–268, 1989.

Reuben, N., et al., "Relationship of High-Risk Behaviors to AIDS Knowledge in Adolescent High School Students," Presented at the Annual Research Meeting of the Society for Adolescent Medicine, New York, N.Y., March 1988.

Ries, Peter, "Characteristics of Persons With and Without Health Care Coverage: United States, 1989," *Advance Data from Vital and Health Statistics*, No. 201, Hyattsville, Md.: NCHS, 1991.

Robins, L. N., and T. Pryzbeck, "Age of Onset of Drug Use as a Factor in Drug and Other Disorders," in C. L. Jones and R. J. Battjes, eds., *Etiology of Drug Abuse: Implications for Prevention*, Washington, D. C.: Government Printing Office, DHHS Publication (ADM) 85-1335, 1985, pp. 178–192.

Robins, L. W., *Deviant Children Grown Up*, Baltimore, Md.: Williams and Williams, 1966.

———, "Sturdy Childhood Predictors of Adult Antisocial Behavior: Replications from Longitudinal Studies," *Psychological Medicine*, 8:611–622, 1978.

Rotheram-Borus, M. J., et al., "Reducing HIV Sexual Risk Behaviors Among Runaway Adolescents," *JAMA*, 266(9):1237, 1991.

Russell, M. A. H., "The Nicotine Addiction Trap: A 40-Year Sentence for Four Cigarettes," *British Journal of Addiction*, 85:293–300, 1990.

Rutter, M., "Protective Factors in Children's Response to Stress and Disadvantage," in M. W. Kent and S. E. J. E. Rolf, eds., *Primary Prevention of Psychopathology: Social Competence in Children, Vol. 3*, Hanover: University of New England, 1975.

———, "Resilience in the Face of Adversity: Protective Factors and Resistance to Psychiatric Disorder," *British Journal of Psychiatry*, 147:598–611, 1985.

Rutter, M., and D. Quinton, "Parental Psychosomatic Disorder: Effects on Children," *Psychological Medicine*, 14:853–880, 1984.

Ryan, N. D., et al., "The Clinical Picture of Major Depression and Adolescents," *Archive of General Psychiatry*, 44:854–861, 1987.

Safer, D. J., and J. M. Krager, "A Survey of Medication Treatment for Hyperactive/Inattentive Students," *JAMA*, 260:2256–2258, 1988.

Schneider, J. A., and W. S. Agros, "Bulimia in Males," *International Journal of Eating Disorders*, 6:235–242, 1987.

Shafii, M., et al., "Psychological Autopsy of Completed Suicide in Children and Adolescents," *American Journal of Psychiatry*, 142:1061–1064, 1985.

Shepard, M., A. N. Oppenheim, and S. Mitchell, "Childhood Behaviour Disorders and the Child-Guidance Clinic: An Epidemiological Study," *Journal of Child Psychology and Psychiatry*, 7:39–52, 1966.

Shope, J. T., et al., "An Elementary School-Based Alcohol Misuse Prevention Program: A Follow-Up Evaluation," *Journal of Studies on Alcohol*, 53(2):106, 1992.

Silber, T. J., "Anorexia Nervosa in Blacks and Hispanics," *International Journal of Eating Disorders*, 5:121–128, 1986.

Small, A. C., "The Contributions of Psychodiagnostic Test Results Towards Understanding Anorexia Nervosa," *International Journal of Eating Disorders*, 3:47–59, 1984.

Sonenstein, F. L., J. H. Pleck, and L. C. Ku, "At Risk of AIDS: Behaviors, Knowledge and Attitudes Among a National Sample of Adolescent Males," Presented at the Annual Meeting of the Population Association of America, Baltimore, Md., March 1989.

Steinhausen, H. C., D. Gobel, and U. Nester, "Psychopathology in the Offspring of Alcoholic Parents," *Journal of the American Academy of Child Psychiatry*, 23:465–471, 1984.

Strober, M., "Personality and Symptomatological Features in Young, Nonchronic Anorexia Nervosa Patients," *Journal of Psychosomatic Research*, 24:353–359, 1980.

———, "Personality Factors in Anorexia Nervosa," *Pediatrics*, 2:134–138, 1985.

Szmulker, G. I., "The Epidemiology of Anorexia Nervosa and Bulimia," *Journal of Psychiatric Research*, 19:143–145, 1985.

Szmulker, G. I., et al., "Anorexia Nervosa: A Psychiatric Case Register Study from Aberdeen," *Psychological Medicine*, 16:49–58, 1986.

Tallmadge, J., and R. A. Barkley, "The Interactions of Hyperactive and Normal Boys with Their Fathers and Mothers," *Journal of Abnormal Child Psychology*, 11:565–579, 1983.

Taube, C., H. Goldman, and D. Salkever, "Medicaid Coverage for Mental Illness: Balancing Access and Costs," *Health Affairs*, 5–18, Spring 1990.

U.S. Bureau of the Census, *Statistical Abstract of the United States: 1991*, 111th ed., Washington, D.C.: U.S. Bureau of the Census, 1991.

U.S. Congress, House of Representatives, Select Committee on Children, Youth, and Families, *U.S. Children and Their Families: Current Conditions and Recent Trends, 1989*, Washington, D.C.: Government Printing Office, 1989.

U.S. Congress, House of Representatives, *Omnibus Budget Reconciliation Act of 1990, Conference Report to Accompany H.R. 5835*, Washington D.C.: Government Printing Office, Report 101-964, 1990.

U.S. Department of Health and Human Services (U.S. DHHS), Public Health Service, Centers for Disease Control, "Increases in Primary and Secondary Syphilis—United States," *Morbidity and Mortality Weekly Report*, 36(25):393–397, July 3, 1987.

———, "Premarital Sexual Intercourse Among Adolescent Women—United States, 1970–1988," *Morbidity and Mortality Weekly Report*, 39(51–52):929–932, 1991a.

———, *Health United States, 1990*, Hyattsville, Md.: U.S. DHHS, Publication (PHS) 91-1232, 1991b.

———, *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*, Washington, D.C.: U.S. DHHS, Publication (PHS) 91-50213, 1991c.

U.S. Department of Transportation (U.S. DOT), National Highway Traffic Safety Administration, *Fatal Accident Reporting System 1988: A Review of Information*

on Fatal Traffic Crashes in the United States in 1988, Washington, D. C.: U.S. DOT, 1989a.

———, *Drunk Driving Facts*, Washington D. C.: U.S. DOT, July 1989b.

Vanderpool, N. A., and J. B. Richmond, "Child Health in the United States: Prospects for the 1990s," *Annual Review of Public Health*, 11:185–205, 1990.

Warner, K., "The Effects of the Antismoking Campaign on Cigarette Consumption," *American Journal of Public Health*, 67:645–650, 1977.

———, "Cigarette Smoking in the 1970's: The Impact of the Antismoking Campaign on Consumption," *Science*, 211:729–731, 1981.

———, "Effects of the Antismoking Campaign: An Update," *American Journal of Public Health*, 79(2):144–151, 1989.

Weiss, G., and L. T. Hechtman, *Hyperactive Children Grown Up*, New York: Guilford, 1986.

Weithorn, L. A., "Mental Hospitalization of Troublesome Youth: An Analysis of Skyrocketing Admission Rates," *Stanford Law Review*, 40(753):773–838, 1988.

Werner, E. E., and R. S. Smith, *Vulnerable but Invincible: A Longitudinal Study of Resilient Children and Youth*, New York: McGraw-Hill, 1982.

Williams, A. F., and R. S. Karpf, "Deaths of Teenagers as Passengers in Motor Vehicles," *Accidents Analysis and Prevention*, 15:49–54, 1983.

Winters, K. C., and G. A. Henly, "Assessing Adolescents Who Abuse Chemicals: The Chemically Dependent Adolescent Assessment Project," in E. Rahdert and J. Grabowski, eds., *Adolescent Drug Abuse: Analysis of Treatment Research*, Rockville, Md.: National Institute on Drug Abuse, Research Monograph No. 77, 1988.

Zabin, L. S., et al., "Adolescent Pregnancy-Prevention Program: A Model for Research and Evaluation," *Journal of Adolescent Health Care*, 7:77–87, 1986.

Zelnick, M., and J. Kantner, "Sexual and Contraceptive Experience of Young Unmarried Women in the United States, 1976 and 1971," *Family Planning Perspectives*, 9:55–71, 1977.

Zill, N., and C. A. Schoenborn, "Developmental, Learning, and Emotional Problems," *Advance Data From Vital and Health Statistics of the National Center for Health Statistics*, Hyattsville, Md.: U.S. DHHS, November 16, 1990.

MR-141-RC